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Consolidated Water Power & Paper Shows Gain

Wisconsin Rapids, Wis., Organization Declares Quarterly Dividend Equal to 75 Cents Per Share Making Third Dividend Declared This Year—During 1933 No Dividends Whatever Were Declared—Leo J. Barrette, General Employment Manager, Discusses the Problem of Management of Employees—Considers Collective Bargaining

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 8, 1934—Quarterly dividends as of October 1 equivalent to 75 cents a share were declared by the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., last week. The basis was three-quarters of one per cent for the quarter, and the total amount paid to stockholders was $60,000.

This is the third dividend declared by the Consolidated company this year. The first was one-half of one per cent, the second one per cent, thus making a return on the stock since the first of the year a total of two and one-quarter per cent. No dividends were declared during 1933.

Wisconsin Forestry Activities

Forestry activities in Wisconsin took great strides in the first sixteen months of the Civilian Conservation Corps program, according to the report of Robert Fechner, director of emergency conservation work. Approximately 10,000 young men were employed, and have planted 31,803,000 trees on 31,000 acres of federal forest lands. They also constructed 1,241 miles of telephone lines, and through improvement of fire-fighting facilities have reduced the hazards over 183,457 acres. Rodent, insect pest and tree disease control operations have been carried out on 127,000 acres. Truck trails have been built through forests for a distance of 908 miles.

Out of the appropriation of $20,000,000 for emergency conservation work, the government has purchased more than a million acres of land for establishment of new forests. Approximately 20,000,000 seedlings have been produced at the federal nursery at Rhinelander, Wis.

All of this is the beginning of a comprehensive forest protection and development program, Mr. Fechner says. The paper industry will be greatly benefited in years to come by assurance of a return of its nearby timber supply.

Paper Freight Complaint Filed

Downward revision of rates on paper shipments has been asked of the Interstate Commerce Commission by the Nekoosa-Edwards Paper Company, of Port Edwards, Wis., and the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis. They declare they are being overcharged on shipments of print paper from their plants to points in the so-called official territory. No reparations are asked. The complaint was filed by W. B. Dalton, traffic manager of the Nekoosa company, and H. D. Wake, traffic manager of the Consolidated company.

Nekoosa-Edwards company also has protested to the Interstate Commerce Commission against abandonment of the Chicago, Milwaukee, St. Paul and Pacific Railroad Company's branch line from Babcock to Norway, Wis. The company has used the line for pulpwood shipments. The railroad company contends the volume has been reduced in recent years to an unprofitable point.

Mills Return to Water Power

Water power shortage which compelled mills along the Wisconsin river to resort almost entirely to steam power have been remedied by heavy fall rains. The flow was down to from 800 to 900 second feet during the summer months, but has now been restored to 28,000 second feet. The series of large storage reservoirs nearly empty a few weeks ago are now nearly 60 per cent full. A great operating saving results to the mills through their return to water power.

News of the Industry

With most of the exterior construction work completed on its new waxing department building, the Badger Paper Mills, Inc., Peshtigo, Wis., is arranging to beautify the grounds. The land will be levelled and seeded, and will later be landscaped. The mill grounds have become one of the show places of the village.

The Kimberly-Clark Society of Chemical Engineers met last week at Hammen Hotel, Little Chute, Wis., with 31 present. Addresses on "Pacific Coast Pulp and Paper Making" were given by W. H. Swanson and Fred Kranhold.

Employment problems of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., were explained by Leo J. Barrette, general employment manager, in an address before the Rotary club of Wisconsin Rapids last week. His talk dealt largely with the "human side" of the problem of management of employees. "The hu-

(Continued on page 34)

Ontario Paper Manufacturers Fairly Active

Fine Paper Mills Only Moderately Busy—Coarse Wrapping Paper Market Continues Quiet—Orders for Glassine, Greaseproof and Waxing Papers Expand—Box Board Plants More Active Than of Late, Due to Improvement In Paper Box Industry

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 8, 1934—Sales volume contines somewhat light in both fine and coarse paper sections in Ontario, the recovery from the holiday season being slower than was expected. Spotty conditions prevailed during September, although in a few lines sales kept up fairly well. Coated paper lines, for instance, were in fairly brisk demand during the month just closed but a reaction seems to have set in and coated stock has dropped back again under the call for cheaper grades. Better class papers, however, are gradually coming back and when the expected loosening up process begins this month there should be a strengthened call for the better class in book, bonds, ledgers and other fine paper lines.

Fine paper mills are only fairly active, although the demand from the publishing trade is keeping up well and mills have some nice accounts in this direction. The paper converting tradé is quiet, envelope manufacturers declaring that business at the moment is hard to get. General stationery lines, also, are quiet, the demand for blank books, business forms and similar lines being disappointingly light. Whether the advent of the fall months will bring better business to the converters it is hard to say, although manufacturers are hopeful that demand will pick up.

The coarse paper market is quiet and the same may be said of the paper bag trade. A satisfactory volume of business is being done by the manufacturers of glassine, greaseproof and waxing papers and orders for these lines are now in fairly good volume. There is keen competition in light weight papers but Ontario manufacturers report fairly good sales and a satisfactory volume of business. There is quite a good call for Canadian-made blanks, tags and covers and domestic blotting papers are in fair demand. The paper box industry is picking up some in a seasonal way and as a consequence there is slightly greater activity in boxboard manufacturing circles.

Less Income for Great Lakes

A less favorable income statement is anticipated for Great Lakes Paper Company, head office, Fort William, Ont., which will release new figures soon. Lower newsprint prices and the replacement of the former substantial premium on United States funds by a discount, are the principal factors responsible for this changed condition. The new statement, which will cover the seven months period of receivership from December 1, 1933, to June 30, 1934, will be in the hands of the bondholders in the course of the next few weeks.

Existing contracts, it is believed, cover a reasonable percentage of tonnage and some economies have been effected in operation, but due to the two reasons mentioned, it is stated that it would be impossible for the new income statement to be as good as the last one, which covered the five months ended November 30, 1933. All that is expected over and above the cost of operations is the coverage of a small portion of depreciation and bond interest.

The outstanding first mortgage six per cent bonds amount to $10,000,000, the interest on which was defaulted on March 1, 1931. Defaulted interest on these to date amounts approximately to $2,400,000. Against this, earnings for the July-November, 1933, period reported were $73,948 with a further $310,417 in the period from the time the present receivers took over in July, 1931 to June 30, 1933. These statements covered administration expenses, fire insurance, and taxes, but allowed nothing for depreciation.

Premium Is a Big Loss

The seriousness of the disappearance of the premium on American funds is indicated by the fact that this amounted to $180,697 for the period from July 13, 1931 to June 30, 1932 and $175,346 in the next twelve months. For the five months ended November 30, 1933 the premium had dropped to $24,596. Since the last named date there has been no premium at all and in the last few months an actual discount. Generally speaking the change in the United States-Canada exchange situation from two years ago represents a price cut of over twenty per cent. Though the NRA has stabilized low prices of newsprint in the United States at around $40 a ton this stabilization has had the effect of preventing further loss rather than allowing operating at a profit. When prices first hit $40 a ton pulp companies believed that ruin could not be averted. It was stated that more than this amount and a premium on U. S. funds would be necessary to allow them to carry on operations in Canada. However, the companies seem to have adjusted themselves to a certain extent to meet the lower prices but the disappearance of the premium and the possibility of a discount have been a body blow. About the only ray of hope on the horizon today is the fact that the NRA agreements in the United States have prevented $35 or even $30 newsprint, figures that were freely predicted when prices started to go down.

Not to Reorganize Yet Awhile

From reliable sources it is learned that there is little possibility of a reorganization of Great Lakes in the immediate future. The general newsprint situation, it is stated, is still too uncertain to permit appraisal of a reasonable basis for future earnings. Moreover, with this and other international companies, where the mortgage trust deed contains no provision to enable a majority of the bondholders to put a reorganization scheme into operation, corporation lawyers are not at all convinced that the new Companies Creditors Arrangements Act, which has been passed by the Dominion Government, will iron out all difficulties.

Box Company Increases Sales

Sales of Canadian Wirebound Boxes, Ltd., for the first five months of the current fiscal year, which commenced May 1, are reported to be running at least 15 per cent above the corresponding period in 1933. Monthly gains have almost been continuous since May, 1933, and while there was some slowing down this summer, fall prospects are better than a year ago. The improvement is said to be general in all lines and not reflecting one industry that might be forging ahead. Wooden, wire bound and cardboard boxes and cartons have all shared in the increased demand as well as a comparatively new line of the company, a corrugated board storage or transfer case for

office use. Selling wirebound boxes to the meat packing industry and to manufacturers of very heavy items like bolts and screws and general hardware, cardboard filling cases to offices and to manufacturers of packaged goods generally and wooden boxes for handling paints, oils and other heavy goods, Canadian Wirebound Boxes is regarded as a sort of general business barometer. In this connection it is significant that the company reports orders coming in from firms which for the past two years have had no need of further supplies, as well as increases over previous orders in almost every case. In addition to new lines by a company which originally specialized in a very narrow field has resulted in a very material reduction in overhead costs. It is stated that as little more time or effort is required to sell four different types of boxes or crates than one and very often the same manufacturer will require some of all the different kinds turned out by the company.

May Develop Montreal River Power

In the meanwhile news comes from Sault Ste. Marie, Ont., that a general expectation exists that Great Lakes Power Company will exercise its rights for power development on the Montreal River. The company owns two hydro-electric power plants, one on the St. Marys River at the Soo and the second at High Falls on the Michipicoten River. From the 63,000 h.p. developed, electrical energy was sold under long term contracts to Abitibi Power and Paper Company which has a plant in active operation at the Soo; Algoma Steel Corporation; Algoma Central and Hudson R.R.; and the city of Sault Ste. Marie.

Correction

Dominion Boxboards, Ltd., of Toronto, Ont., draw our attention to several inaccuracies in a news item about York Paper Mills, Ltd., which appeared on page 13 of the September 27 issue of the PAPER TRADE JOURNAL.

Dominion Boxboards, Ltd., state that York Paper Mills, Ltd., are renting a section from Dominion Boxboards, Ltd., not the Dominion Paper Box Company, Ltd. The Dominion Boxboards, Ltd., are manufacturers of boxboard and cartons. The Dominion Paper Box Company, Ltd., is entirely a different company, and has no connection with the Dominion Boxboards Company.

The last paragraph of this item should read—The company has made arrangements to buy its steam for process work, and also its power from Dominion Boxboards, Ltd.

General Trade Notes

The Victoria Box and Paper Company, Ltd., Vancouver, are now carrying a complete stock of envelopes and other lines manufactured by Barber-Ellis of Vancouver, Ltd. Arrangements were recently completed between Lorne D. Graham, western supervisor of the Barber-Ellis organization, and managing director of Barber-Ellis of Vancouver, Ltd., and R. L. Challoner and L. Glasen of the Victoria Box and Paper Company, whereby the latter firm will establish a warehouse service in Victoria to meet the demands of Vancouver Island customers of the Barber-Ellis organization. Complete stocks of envelopes and stationery produced by the Vancouver plant will be carried at Victoria and regular supplies will be made weekly from Vancouver to the Victoria warehouse in order to maintain a full stock of all lines.

Interlake Tissue Mills, Ltd., Toronto, have now established their warehouse on the second floor of the new building of Barber-Ellis Vancouver, Ltd., on Homer Street, Vancouver, B. C. The Toronto company have operated on the coast for some years.

Weekly Production Ratio Report

Reports to the Paper Industry Authority show the following Over-All Industry Production Ratios for designated weeks.

	Reporting Mills		Total Production
	Number	Capacity	Ratio
*Week ending September 1, 1934....	267	107,017	62.3%
*Week ending September 8, 1934....	288	107,412	52.2%
*Week ending September 15, 1934....	280	110,214	57.5%
*Week ending September 22, 1934....	275	115,984	60.6%
*Week ending September 29, 1934....	208	81,745	59.6%

The weekly paper capacity (based on 6 days of 24 hours each) for all mills operating wholly or partially under the General Code for the Paper and Pulp Industry is approximately 175,000 tons. This figure has been tabulated from mill questionnaires and in certain instances from daily capacities given in Lockwood's Directory of the Paper and Allied Trades.

Detailed statistics showing the number of mills reporting by ratio groups are given below:

NUMBER OF MILLS REPORTING

	Week Ending				
Ratio Limits	Sept. 1 1934	Sept. 8 1934	Sept. 15 1934	Sept. 22 1934	Sept. 29 1934
0% to 50%.....	116	148	128	110	79
51% to 100%.....	151	140	152	165	129

* Subject to revision.

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours" were as follows:

Week ending September 8.....	53 per cent
Week ending September 15.....	67 per cent
Week ending September 22.....	62 per cent
Week ending September 29.....	64 per cent

Revised statistics covering delinquent mill returns will be shown in later reports.

Minimum Mark-Up Under Paper Distributing Code Extended to January 31

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 10, 1934.—Extension until January 31, 1935, of the order requiring a minimum mark-up over replacement cost in all sales of merchandise of the paper distributing trade and extension of the specified scale of mark-up, was announced by the National Industrial Recovery Board.

This order expired on October 1, but was renewed and extended to give full opportunity to collect data on its operation.

The Board was informed that "operations under the replacement cost and allowance for wages of labor have not led to increased prices," and that "operations under the replacement cost provision have resulted in orderly marketings of speculative stocks of paper accumulated during 1933, and have stabilized paper mill operations by discouraging speculative buying during the summer just passed."

Trade Practice Complaints Committee

The National Recovery Administration has announced approval of a trade practice complaints committee for the paper distributing trade as follows: Arnett W. Leslie, 536 Sexton Building, Minneapolis; O. F. Marquardt, 41 Park Row, New York; S. L. Wellhouse, National Paper Company, Atlanta, Ga.; R. S. Bull, 333 South Desplaines street, Chicago; C. A. Esty, Carter, Rice & Co., Boston; E. G. Kerwin, Graham Paper Company, St. Louis, Mo.; H. L. Zellerbach, 311 California street, San Francisco; T. J. Nagle, Thos. J. Nagle Company, Inc., Hollis, N. Y.; H. B. Finch, Nash-Finch Company, Minneapolis.

Chicago Paper Market Conditions Irregular

Demand for Various Standard Grades of Fine Paper Only Fairly Active—While Book Paper Reports Are More Optimistic, Cover Papers Are Only Moving Slowly—Kraft Wrapping Paper Comparatively Firm—Paper Board Practically Unchanged

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 8, 1934—Business in the Chicago paper market gave no real indications of a sturdy Fall upturn during the past six days. Reports earlier in the week gave some evidence of improvement based on the previous week's performances but about the middle of the week this betterment was reported to have bogged down somewhat.

Specific markets all showed signs of this dullness which is belying immediate expectancy of a seasonal upturn. Fine papers were reported as only fair and spotty. Covers were said to have been slower this week than last though book paper reports were slightly more optimistic. The kraft market was fair with the market comparatively firm. Merchants are hoping confidently that need for replacements of inventory will soon bolster up the demand here, as in other lines.

Groundwoods were slow although inquiries were still floating around in the air. The paper board market registered little or no change over the previous week. The waste paper market reflected the general situation and, with the exception of a very few spots, was quiet. The newsprint market reported definite rumors to the effect that the newsprint price had been stabilized at $41.00. This is expected to have an improved effect on the local market.

James H. Coy Resigns

James H. Coy, Jr., has announced his resignation from the Eastern Manufacturing Company, together with the information that a new connection in the paper industry would be given out within the next seven days. Mr. Coy, son of Jim Coy, of Flambeau, has already made an enviable name for himself in local trade circles and his new connection will be watched with interest in this locality. Jim, Jr., began his paper career with the Dietrich Paper Company and after a short interval there, came with the Chicago offices of Eastern four and one half years ago. His experience there and the contacts he has made are certain to prove invaluable to him in his new position which, it is understood, is to be with the Chicago sales division of a well known paper manufacturer.

R. E. Wantz Heads Private Business Movement

R. E. Wantz, executive head of the Rockford Fibre Container Company, has been appointed the organizer of a committee to inaugurate a campaign throughout the country in opposition to governmental invasion of private industry. Mr. Wantz, well known in the paper industry, was given this recognition by sixty industrial leaders who met in Chicago this week to launch a vigorous campaign against the increasing inroads of the federal government into the field of private business. He is expected to appoint his committee in a very short time.

The meeting of industrial leaders resulted in the sending of two resolutions to President Roosevelt, to all members of Congress and to all candidates for Congress. The one resolution was the appointment of Mr. Wantz and the other called on the Chamber of Commerce of the United States, the National Association of Manufacturers, and on trade and industrial associations, to urge the federal government to abandon participation in business which competes with private enterprise.

Salesmen's Final Golf Outing

Nearly two hundred members and guests enjoyed the Middle West Division of the Salesmen's Association's final golf outing held at the Flossmoor Country Club on September 27. The attractive program and the long list of prizes held a great many of those in attendance at the N.T.T.A. meetings in Chicago for this windup event which is now secure as an annual outing. While the long list of prize winners is not available as the chairman, Dick Cook, is out of the city, the two important prize winners are on record. Jack Burrus, of the Albermarle Paper Company, won the President's Trophy; while the *American Paper Merchant* trophy went eastward to grace the New York offices of the eastern division of the Association.

Kraft Division Meets

The Kraft Division of the paper industry held its regular meeting in Chicago on October 4. All sessions were held at the Drake Hotel. Coming closely on the heels of the Fall Meeting of the N.P.T.A., the sessions gave the Kraft executives an opportunity to consolidate programs effected at that meeting.

News of the Trade

Through the Bermingham & Prosser Company and Bradner Smith & Co., Chicago distributors, the Oxford Paper Company has recently issued an attractive broadside printed on Oxford Mainefold Coated and describing the qualifications of Oxford in the carrying on of modern high speed printing. The broadside announces the stocking of Oxford Mainefold Coated in nine sizes, various weights and in grain and ivory. A scene in the coating mill of the Oxford Paper Company showing how the coating material is applied to the body stock, brushed smooth over the width of the paper and then dried, is a feature of the current mailing.

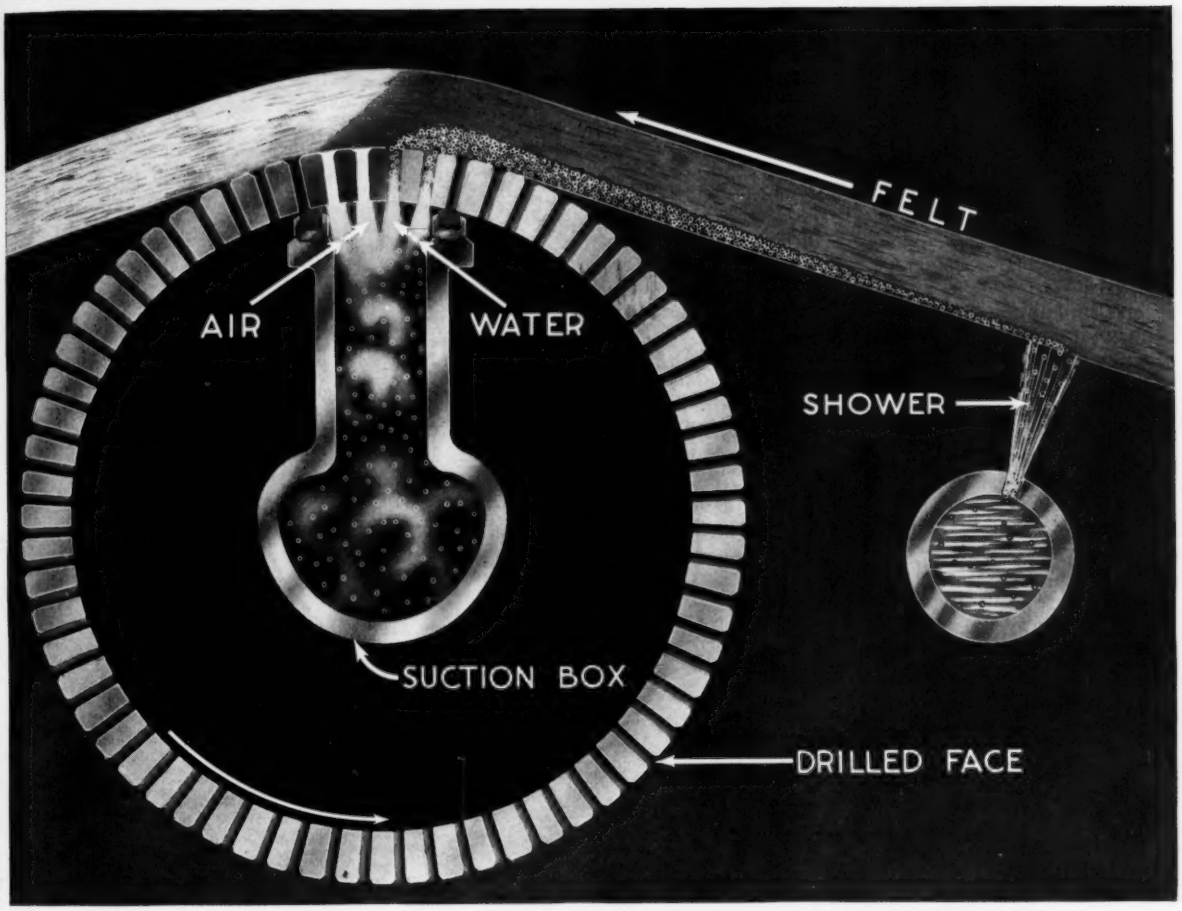
The Heco Envelope Company has recently recommended Skyline Bond, a full rag content paper for letterhead and envelope use as "satisfying the most discriminating customer and making the best possible impression on the recipient." The bond is made especially for Heco, one of Chicago's largest envelope manufacturers and is purchased in shipments direct from the mill.

An Evidence of Improvement

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 8, 1934—Indications of a further revival in the paper business in Indiana are seen in a statement today of Clarence A. Jackson, director of the income tax department, to the effect that on October 1 more paper mills and paper jobbers had received licenses at his office than during the entire year of 1933. Income taxes from these sources for the first nine months also were considerably higher than the same period the year before.

DOWNINGTON



Wash & Dry *All* the Felt *All* the Time

The full width of the felt is continuously and uniformly WASHED and DRIED by the Downingtown Suction Felt Roll without damaging, wearing or stretching the felt. The shower is installed close to the roll thus the water thoroughly cleanses the sheet side of the felt and is immediately withdrawn before it has a chance to soak clear through; the remaining holes in the suction area drawing more air than water. The roll takes only about one-ninth the power consumed by the drag of flat suction boxes. It requires no drive and is easily handled and installed in any position on any machine, for it takes no more space than a plain felt roll. The Downingtown Mfg. Co., Downingtown, Pa.

CONDITION YOUR FELTS WITH A SUCTION ROLL

Demand for Paper Moderately Active In Boston

Seasonal Request Developing for Various Standard Grades of Fine Paper—Kraft Wrapping Paper Moving In Fairly Good Volume—Box Board Market Continues Rather Quiet—Paper Stock Section Inactive, With One or Two Exceptions

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., October 8, 1934—Paper merchants in Boston and vicinity transacted a moderate amount of business during the week under review. Although still somewhat unsettled, with conditions at Washington possibly one of the factors in the situation, the market is expected to be in better shape after a meeting of the Paper Code Authority to revise the Code to be held in New York later in the month. Seasonal demand is developing to a certain degree. In fine papers, "things are picking up a little." Within the last week there "was quite a spurt" in one large house, which has been "doing very nicely." Wrapping paper moved in fairly good volume, with the demand from the textile mills restored, although there was somewhat less activity in some quarters than during the previous week. Box coverings showed some improvement the last week. Box board dealers report business as rather quiet, at least in some quarters. There is more or less of a lull with the shoe box manufacturers, although there is more activity among candy box makers.

Except in one or two grades, the paper stock market was inactive and even in the grades moving, not a very large quantity was sold. The market continued in a somewhat uncertain condition. Code prices prevailed on old newspapers. In mixed papers, buying was exceedingly light. Corrugated boxes were in good demand, but packers were not anxious to sell, especially at the low prices prevailing—32½ @ .40—except in cases of distress. Reports from the road were unfavorable. Box board chips declined to .25 from 32½ @ .35, a prominent concern paying this figure. Bagging, new and old domestic rags and foreign rags were quiet.

News of the Trade

Carter Rice & Co., Corp., is distributing another broadside, of Oxford Mainefold Coated, featuring the Oxford papers, made by the Oxford Paper Company, Rumford, Me. These papers fill the requirements of high speed printing, are definitely designed and made to meet the most exacting practices and needs of the modern pressroom. The broadside shows pictures of paper going on a coating machine in the Oxford paper mill and how the coating material is applied to the body stock, and brushed smooth over the width of the paper.

At the Direct Mail and Graphic Arts Exhibition to be held under the auspices of the Direct Mail Advertising Association, Inc., at the Hotel Statler, October 9-12, Carter Rice & Co. Corp. will have a novel display, cooperating with the Oxford Paper Company.

The Carter Rice concern is stocking Derby Bond, made by the American Writing Paper Company. This paper is a new air-dried, cockle finish, sulphite sheet, developed by the company. It is water-marked, with the price somewhat lower than the regular 25 per cent rag content paper.

The Storrs & Bement Company, at its office, is giving a three weeks' display of papers made by the S. D. Warren Company, which closes October 20.

At the recent sales meeting at the office of the Storrs & Bement Company in regard to Strathmore papers, with President William N. Stetson, of the local company, presiding, the following were speakers from the Strathmore Paper Company: H. A. Moses, president; John D. Zink, vice-president, and E. Hughes, salesman in this territory.

Boston paper men who attended the meeting of the National Paper Trade Association in Chicago found conditions in the trade very healthy throughout the West. Those who went from here included Frank B. Cummings, who was executive secretary of Regional Committee No. 1 of the Code Authority for the Paper Distributing Trade; Charles A. Esty, delegate from the New England Paper Merchants Association, Fine Paper Division; Matthew O. Byrne, delegate from the same organization, Wrapping Paper Division; F. Bendel Tracy, president, and John E. Roach, vice-president of the Fort Hill Paper Company.

The local office of the Union Bag and Paper Corporation has been removed to 136 Federal street from 176 Federal street. Lennox Ransom is in charge of the office. Henry C. Lawless, formerly in charge, is now directing the Chicago office.

Walter P. Simonds, treasurer of the Train Smith Company, paper stock dealers, is expected to return today from his trip to England.

Albert T. Hicks, treasurer of Daniel M. Hicks, Inc., paper stock dealers, New York City, called on the trade last week.

H. M. Davies, of the Nashua Gummed and Coated Paper Company, Nashua, N. H., is to be one of the speakers at a meeting of the New England Office Management Association at the University Club tonight.

Closes Case Against U. S. Envelope Co.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 8, 1934—The Federal Trade Commission last week made public a consent cease and desist order closing its case against the United States Envelope Company, of Springfield, Mass., charged with violating Section 5 of the Federal Trade Commission Act.

The United States Envelope Company is a manufacturer and importer of paper used in printing books and for stationery. The respondent company was charged with using trade names which had a tendency to deceive the purchasing public into believing that paper made in the United States was manufactured in a foreign country and imported.

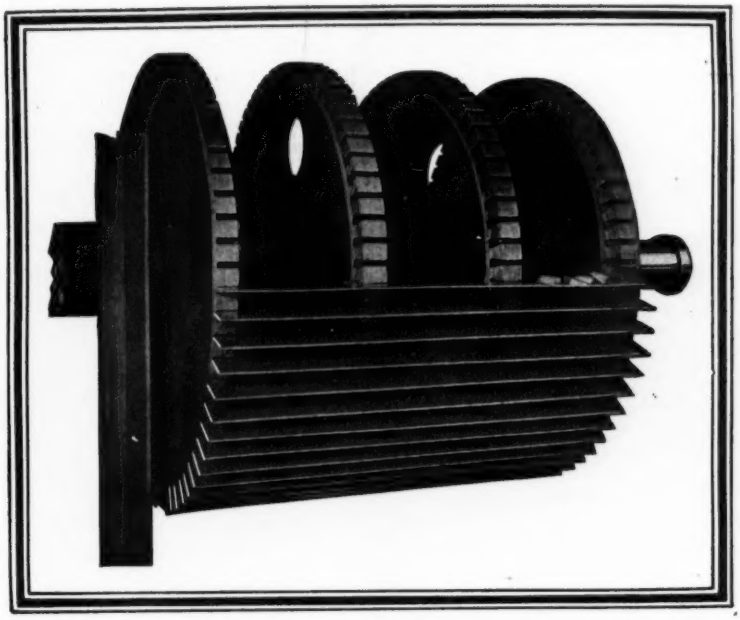
The respondent was also charged with representing paper made by machine process as being hand-made paper.

The respondent company, in filing its answer to the Commissions complaint, consented to the issuance of a cease and desist order by the Federal Trade Commission.

In this consent order, the respondent agrees to cease and desist from the use of the words "Japan," "Milano," and "Oxford," and of any other word or words implying a foreign origin for paper actually manufactured in the United States.

With respect to the charge that the respondent company was selling machine-made paper as hand-made, the Commission dismissed that charge, finding that the paper was actually hand-made.

October—



Good beater rolls are absolutely necessary in stock preparation. You should use Dilts patented bandless all-steel rolls in both your breaker beaters and your finishing beaters. More than one thousand Dilts bandless rolls are in use in paper mills on practically every grade of stock.

—Dilts—

MACHINE WORKS Inc. FULTON, N.Y.

"Your Paper Is Made in Your Beaters"

Paper Business Improves In Philadelphia

Volume of Sales of Various Standard Grades of Paper Expands—Observers Predict Slight Upward Movement During Next Three Months—Change of Sentiment Should Prove Important Factor In Situation—Paper Stock Market Continues Dull

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 8, 1934—Quite a significant change for the better in some branches of the paper trade, which manifested itself a week or two ago, is still in evidence. Business sentiment is improved. Business itself is better—better in volume and better in tone. Some of those who have been closely observing this change prophesy that the next three months will see a slight upgrade movement. It will, in all probability, be a spotty, uneven sort of movement, but this change of sentiment is going to be an important factor. It is felt that Washington influences will be a bit more strengthened from now on, in that the proposed revision of the NRA seems likely to be along lines more pleasing and encouraging to business.

Naturally, everything for the next few weeks will be tinged with politics, and yet we have no assurance of the complexion of the next Congress. The proposed revision of the NRA is encouraging to business. In discussing the question of this latest revision of codes with one of the pioneer paper merchants of this city, he told your correspondent that the average business man is not against the principles of industrial codes, but he is demanding that the codes be made practical and that when they are made practical, that they be enforced. All-in-all, business is going to insist on shaping a permanent setup, and the present indications are that the voice of business will be listened to.

During the week official notice was sent out to all merchants in the Philadelphia Trading Area to the effect that price reporting was suspended on kraft paper, gummed tape, tissue and grocery bags.

A meeting of the wholesale waste paper and cotton rag dealers of the Philadelphia Trading Area is called for Friday evening, October 12, at the Lorraine Hotel, Broad and Ridge Avenue, for the purpose of electing committees, selected from the ranks of the wholesale merchants, to assist in administering their code. This notice was sent out over the signatures of William J. McGarrity and Harry M. Bailey, members of the National Code Authority for the Waste Paper Dealers, and Dominic DiSanti together with James J. O'Neill, members of the National Code Authority for the wholesale cotton rag industry.

In the waste paper industry here the mills show no inclination to buy, and it is the concensus of opinion that they are working on their surplus stock, which is responsible for the dullness experienced by those in the trade here. On the other hand, their surplus cannot last for all time, and they are bound to have to come into the market to buy, which will improve the conditions all around.

News of the Trade

The regularly scheduled meeting of the Philadelphia Paper and Cordage Association, Inc., will take place on Friday, October 19, at the Adelphia Hotel. A very elaborate program has been arranged by Leslie C. Bartlett, chairman of the Entertainment Committee, the details of which will be announced in these columns next week.

The Hampshire Paper Company, South Hadley Falls, Mass., has just appointed the Hooper Paper and Twine Company, 105 Church street, exclusive distributors for their new 25 per cent rag bond; this comes in white and five colors.

The very popular secretary of the Philadelphia Paper and Cordage Association, and also branch manager of Denny Tag Company, of West Chester, Pa., Harry S. Platt, and his wife are receiving congratulations on the birth of a daughter, Ann.

Guy Beckett, of Beckett Paper Mills, Hamilton, Ohio, was entertained today by Morgan H. Thomas, and George W. Weaver, president and vice president respectively of Garrett-Buchanan Company accompanied by Jesse C. Long, president of the Long Publishing Company, in a foursome of golf at the Llanerch Country Club.

Executive Secretary Howard P. Beckett, of the National Paper Box Association, announces that the standard invoice order and acknowledgement form for the industry has been approved by the Administrator at Washington.

William R. Kreeger, assistant to Mr. Beckett, has been visiting in the south this past week, stopping at Richmond and the smaller cities in North Carolina.

It is our pleasure to report that Charles W. Mather, of the Mather Paper Company, who has been critically ill in the Jefferson Hospital, is very much improved.

Fafnir Cork-Insulated Ball Bearing Pillow Block

The bearing is of the wide inner ring type with the exclusive Fafnir Self-Locking Collar. It has a deep groove, large-ball design, which affords high load capacity, thrust as well as radial. The housing is typical of the Fafnir design, being of cast iron with ribbed base, compactly designed so as to possess the maximum strength within its limited physical dimensions. It is prelubricated at the time of assembly, assuring attention-free operation for at least a year. The lubrication is renewable by means of grease tubes as the proper fitting is included in the housing.

The insulation is a cork pad, which fits into the housing and around the bearing itself to insure silent operation. It is treated so that no separation of particles can occur. It acts also as a seal against the escape of lubricant or the entrance of dirt.

The features, briefly, of this Fafnir Cork-Insulated Ball Bearing Pillow Block are, compactness with ample capacity, freedom from friction, self alignment, ease of assembly, and silence.

For Corporation of Authority for Corrugated Solid Fiber Container Industry

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 8, 1934—Approximately suggestions concerning a proposed amendment to permit incorporation of the code authority for the corrugated and solid fiber shipping container industry must be filed by October 13, with Deputy Administrator David H. Tulley, Room 209, National Savings and Trust Building, Washington.

Lubricants and Tests Related To Service Value*

By L. F. Jahnke[1]

Whether we realize it or not we all have more or less of a fund of information about lubricants. We gather this information from their use and observation of how they work, by looking at and feeling the lubricants themselves, by hearing or reading specifications in technical papers or in letters, and occasionally we learn something from an oil man. This rather considerable fund of information exists in most of our minds in a rather disorganized state. Some parts of the information are missing, others have been half forgotten, some of the things we know aren't so, and none of the facts seems to bear much relation to any of the others.

Suppose we attempt to organize this information so far as it relates to the lubricants themselves. This means excluding for the present, consideration of how lubricants are best applied, the requirements of specific machines, reclamation of oil and so on. Each of these is a big and interesting subject and cannot be treated briefly.

In the space alloted we cannot hope to cover even the subject of lubricants and their tests in technical exactness. Their relation to service value, however, can be pointed out with sufficient detail to at least dispel many false notions and perhaps aid in the intelligent purchase of oils and greases.

With this in mind it would seem desirable to first discuss the lubricants themselves, together with what may be learned by a visual examination and by the sense of touch. Secondly, the common laboratory tests will be described and their significance noted. Throughout, all that may be learned by inspection or laboratory test will be related to probable service results.

Bearing Oils

On the score of color, bearing oils may be divided for convenience into three classes: pale oils, red oils, and black oils.

A light colored oil may be the result of careful refining and extensive filtration, or it may simply be its natural color resulting from the crude used. The process of getting stability and high quality tends to produce a light colored oil. However, light color alone can be obtained without going to the expense necessary to make the oil stable and a good lubricant. Hence, light color is not a guarantee of quality or suitability for any purpose. It does, however, permit ready examination for moisture, which will appear as cloudiness in the oil, and for sediment, which will show on the bottom or in suspension.

Red oils of light body are generally those which have not been treated to remove their color. However, their red color may result from the intentional addition of as little as .1 of 1% of one of the dark residual products of which we will speak in a moment. While red oils may be good lubricants, they generally do not show as ready a separation from water and as low a carbon content as a highly-refined light-colored oil. A red color is not a guarantee of quality or suitability for any purpose, neither does it necessarily mean that it is inferior to a pale oil about which nothing is known but the color. A colored oil is of course a little harder to examine by eye for contamination.

High-grade bearing oils of heavy body are usually of a deep transparent red color, due to their being made largely of "bright stock" cylinder oil. This type of cylinder oil is itself a highly refined product, but of characteristically deep red color. It will be described in greater detail a little later on.

Black oils are generally low-priced and usually open to suspicion on the score of high tarry matter content and suspended impurities. They ordinarily have poor stability, frequently have a tendency to thin out rapidly as the temperature goes up, and often have very low flash points. They ordinarily should be used only for the roughest and most wasteful types of lubrication. They are usually made by cutting back one of the heavy black residuals described later.

White Oils

To the above three classes we may add white oils which range from crystal clear to a very pale straw color. These are not ordinarily used for lubrication, due to their high cost of manufacture and also because the extreme refinement necessary to obtain them generally lowers their lubricity or oiliness. Their chief use in the paper mill lies in the processing of paper. They have a nomenclature all their own to describe the purity and color required in this work.

Thus it would appear that an oil cannot be chosen on color alone, but its color certainly tells us a number of interesting things about its probable make-up and possible limitations in service.

With the exception of the black oils and the heavy bearing oils which were noted as being blends, all of the foregoing types of oil are distilled, or "overhead oils" in the terms of the refiner. The remaining two classes of oil to be considered are ordinarily drawn from the part that does *not* distill over, but is left behind in the still.

Cylinder Oils

The first of these two classes is cylinder oil which is heavy, more or less opaque, and which becomes quite thick or even solid at temperatures well above freezing. When the refiner starts with a very clean high-grade crude and distills off the overhead oils without the use of too much heat and does not carry the distillation too far, the stock remaining in the still is cylinder stock. It has high lubricity or oiliness and is resistant to heat, but is generally less clean and rapid in its separation from water than an overhead stock. The ordinary steam cylinder oil is said to be "steam refined," which refers to a refinery process of injecting live steam into the still to permit removal of the overhead oils at a lower temperature and with less injury to the cylinder stock. The better cylinder oils are filtered to clean them up.

This same cylinder oil may then be subjected to additional refinement by acid treatment to remove tarry matter (certain stocks do not require this step), centrifuge to remove wax, and filtration to lighten the color. This type of cylinder oil is known as "bright stock" because of its deep red transparant color. This treatment improves the property of separation from water, lowers the pour point, and entirely removes all sediment, giving a zero precipitation number.

Bright stocks are used in the finest cylinder oils because they leave practically no deposits and give better separa-

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*Presented at the fall meeting of the Northwestern Division of the American Pulp and Paper Mill Superintendents Association, Wausau, Wis., September 21-22, 1934.

[1]Technical Mgr., Wadhams Oil Co. (A Socony-Vacuum Co.). Assisted by Alfred Gennrich of Wadhams' Milwaukee Laboratory.

tion from exhaust steam than the conventional cylinder oil. They are also used to an even greater extent in blending motor oils for internal combustion engines. They are also used to blend with the lighter overhead oils to give the heavier bearing oils as noted above.

The quality of a steam cylinder oil cannot be determined by its feel or color, and its body at room temperature is a poor indication of what it will be at the temperature of the cylinder. Often a poor oil will appear to have good body at room temperature, but will thin out rapidly with heat. Neither can a bright stock cylinder oil be said to be superior for all purposes to a steam refined cylinder stock. For certain types of work requiring greater tackiness and adhesiveness, steam refined stocks appear to give better results than the cleaner and more expensive bright stocks.

Residuals

The second of the two types of oil to be left behind in the still are the heavy, black, almost tar-like products known as "black residuals." These find their use in heavy open gear lubrication, on cables and as a protective coating on heavy rough machinery. When cut back with light distilled oils they furnish our black oils as noted above. There can be a great difference in the quality, cleanliness and performance of these residuals, but this cannot be determined by the eye or the touch.

The foregoing constitutes the entire list of petroleum stocks and any oil you buy will be one or a combination of these stocks. Oils in this form are referred to as mineral or more specifically as "straight mineral" stocks. The distinctions presented so far are those which you can see with the eye. Other characteristics which can only be found by laboratory test will be given later.

Compounding

All of the above oils may be compounded with animal or vegetable fats, and some, such as the cylinder oils, are ordinarily sold in the compounded form. Tallow and lard oil are commonly used to compound cylinder oils. Degras, which is the fatty oil of sheep's wool, is a cheap compounding also used in cylinder oils, formerly more than at present.

The purpose of compounding a steam cylinder oil is to give it the ability to emulsify with water and stick to the cylinder wall. The proper percentages and types of compounding, the problem of separation of oil from exhaust steam and numerous related questions are too involved to go into here.

Bearing oils may be compounded in similar manner to give greater lubricity or to withstand the washing action of water. Rapeseed compounding is effectively used for this purpose and gives a cream-colored adhesive emulsion in the presence of water. Other compounding agents are sperm oil, oleic acid (elaine), neatsfoot oil, linseed, cottonseed, and fish oil. The presence of compounding in a mineral oil can be detected by smell, but the percentage cannot be determined except by laboratory methods. Even then the chemist cannot tell the exact percentage unless he knows the kind of compounding and this is often difficult or impossible to determine in the laboratory.

It should be remembered that compounded oils must not be used where ready separation from water is desired, as in a circulation system. Incidentally, compounded oils should not be stored in galvanized containers as the zinc is affected by the compounding and throws out zinc soaps into the oil.

Grease

Grease is fundamentally nothing but a mixture of oil and soap, although both the oil and the soap may be any one of a number of kinds. Lime (calcium) soap greases are water repellent, of smooth texture and have practically no fibre or grain. They probably constitute 95 per cent of the grease used. The common cup grease is ordinarily a lime soap grease.

Soda (sodium) greases are generally fibrous in structure, are heat resisting, and mix readily with water. This last characteristic leads to their use in certain water washed bearings, as they give an adhesive emulsion when wet. High melting point greases are always soda base. The usual fibrous or spongy structure of these greases often leads to their being called "fibre" or "sponge" greases. However, soda grease can be made so as to exhibit practically no fibre or grain.

Other metallic soaps are also employed, notably aluminum stearate, which gves a smooth, fibreless and relatively transparent grease. Grease of this type exhibits no definite melting point, softening up gradually under increasing temperature.

All of these greases may employ oils of different body, color, and quality, which may affect the appearance and performance. It is sometimes said that a grease is no better than its oil. This is true, but it is equally true of the soap which may show considerable variation in resistance to breakdown in use and bleeding in the barrel. Quality in this respect is entirely dependent on the experience and skill of the grease maker and is not a factor that can readily be tested in any other way than by the use of the grease. Incidentally, a little thought will indicate that between two greases of equal body and similar manufacture, the one containing the heavier oil will have the most oil and the least soap per pound. This is important where solid deposits are undesirable.

The odor of a grease may be its natural smell, but frequently results from a perfume added to disguise the natural odor or give one the buyer is used to. Oil of Mirbane is responsible for the "shoe blackening" smell of certain greases. Oil of Citronella is another favorite perfume of the grease makers. Do not attempt to judge a grease by the smell. Neither is color a criterion of quality. You can tell the type of grease by eye, as a rule, and the chemist can determine the body of the oil, but its service value is determined by how well it is made which only appears in use.

Specialties

The above described lubricants are the typical kinds, but there are a number of special products, some of which have definite legitimate uses and others of which are offered as cure-alls for every lubrication ill, real or fancied.

Extreme pressure lubricants are very essential for the few places where they must be used, as in hypoid gears, but should never be used elsewhere for a number of very good reasons. This subject is also worthy of separate consideration and cannot be discussed here.

Graphite, talc, mica, asbestos and certain other materials are favorite "dopes" which may have a place in smoothing up a rough bearing, but generally do nothing but promote additional wear once the bearing is smooth. They should be used advisedly if at all.

Do not be overly impressed by claims of mysterious virtues possessed by a special lubricant. If the virtues are real they are not mysterious and can be explained so you can understand them. If the man calling on you can't do it, it's his fault, not yours. Most of the impressive terms used to describe special oils and greases have a very homely meaning when the truth is told.

Laboratory Tests

Up to this point we have briefly sketched the types of

lubricants, their relation to one another and what characteristics might be observed by the senses. The senses alone, however, are very poor measuring sticks for petroleum products. Because of this an immense amount of effort and money has been spent in an attempt to devise instruments and processes which will measure qualities that have some relation to service value, and measure them in a way that will give the same readings to all men. Since these test readings come to your attention from time to time, it is proper to consider how the tests are made and what they mean.

Viscosity

We think of one oil being thin and another one thick. Really the difference lies in the relative ease with which the molecules of oil slide over one another. Viscosity is a measure of this internal friction of an oil and this of course has a very definite relation to the oil drag in a bearing, flow through pipes, etc.

We measure this resistance by allowing 60 cubic centimeters of oil to flow through a standardized orifice at some definite temperature. The length of time it takes in seconds is known as the viscosity at that temperature.

Do not attempt to judge oil viscosity by stirring it, inverting a bottle and letting a bubble rise or a ball fall through the oil. All these tests can be very deceptive. And remember that a light colored oil *appears* to have a much lighter body than a dark-colored oil of the same viscosity.

Viscosity is the most important single property of an oil, but it has no relation to quality. It does, however, have a very definite relation to suitability when balanced against the effect of temperature, pressure and speed in a bearing. High temperature, high pressure and slow speed each tend to require a heavier oil. Moderate temperature, moderate pressure and high speed require a light oil. Considerable experience is required to strike a proper balance between these characteristics and several others to be considered later. A high viscosity oil may cost more, but the best service is given by the lightest bodied oil that will preserve a film between the metallic surfaces and leave a reasonable margin of safety.

Color

Color is measured by comparing a 4-oz. bottle of oil with standardized plates of colored glass. Transmitted light, which may give a quite different effect than reflected light both in shade and intensity, is used. The usual color standards measure only depth of color, a No. 1 being a light straw and a No. 8 being practically opaque in a 4-oz. bottle. No attempt is made in this method to measure the ***kind*** of color. For instance, a red, yellow, and green oil would all be given the same number if their *depth* of color was the same.

Color does not represent quality or suitability for any particular purpose. What can be deduced from color has been discussed above. Unless light color is essential it should not be demanded, as it normally tends to run up the cost of the oil furnished.

Pour Point

The pour point of an oil is determined by cooling a 4-oz. bottle of oil at a specified rate and finding the temperature at which it fails to move when the bottle is turned on its side for five seconds. The pour point is then taken to be 5 degrees above the temperature.

In many oils the pour point does not mark a sharp change as when water turns to ice, but only marks an arbitrary point in the gradual thickening that takes place as an oil is cooled. Such oils will readily pour from a bucket at temperatures considerably below the pour point found in a 4-oz. bottle. They may likewise refuse to flow in a small tube at temperatures considerably above this point. These oils contain whatever wax they have in the formless or "amorphous" state.

Oils containing wax in crystalline form show a much more definite pour point and may be quite fluid very close above this pour point and quite solid just below it. Pennsylvania oils if not sufficiently dewaxed exhibit this tendency.

Hence it is self-evident that the pour point is only a bare indication of an oil's probable action at low temperature. Pour point readings must be interpreted in the light of the oil's resistance to flow above and below the recorded pour point and in relation to the method of application, pumping equipment, size of pipes, bearing clearances, etc., etc. It is a mistake to assume that an oil will continue to operate satisfactorily right down to its recorded pour point or that it will necessarily fail to operate below this point. It depends a great deal on the oil and where it is used.

Gravity

The weight of an oil in relation to a like volume of water is called its specific gravity. This is expressed as a decimal and usually ranges between .850 and .950 for lubricating oils. Another way of expressing the same quality is found in the Baumé scale. (The particular Baumé scale used is also known as the A.P.I. (American Petroleum Institute) scale. Either scale can be converted to the other by formula or table. For illustration, a specific gravity of .850 equals an A. P. I. or Baumé gravity of 35, while a specific gravity of .950 is equal to 17.6 on the A. P. I. or Baumé scale. The reading is of use to the refiner in holding products uniform and to the laboratory in identifying oils, but it is of little use as an index to the quality or usefulness of a lubricant.

Flash and Fire

The flash point of an oil is the temperature at which a momentary flame will play across the surface of the oil when heated in a standardized cup and ignited by a small flame. The fire point is the temperature at which the flame will burn continuously.

Flash and fire points do not necessarily bear any relation to the usefulness of an oil. They in a measure indicate its tendency to evaporate and its resistance to deterioration under extreme heat, but both these effects are almost negligible in ordinary use.

Demulsibility

It is important in many cases to know how readily an oil will separate from water. This property is known as its "demulsibility." Several methods of measuring demulsibility are in use, no one of which is readily comparable with any other. The Steam Emulsion Test favored by the A. S. T. M. (American Society for Testing Materials) consists of piping steam into an oil under standardized conditions and then noting the time required for separation of water and oil. The number of seconds elapsed is reported as the Steam Emulsion Number. Another method is the Herschel, which reports rate of settling in cubic centimeters per hour.

Oil for steam turbine and engine circulation systems should have good demulsibility, while in general purpose oils demulsibility is of little or no importance. For illustration, a steam emulsion number of less than 100 or Herschel of 1620+ (the maximum) would be expected in a turbine oil.

Oxidation

No easy, satisfactory, and commonly accepted method has been devised for measuring the tendency for an oil to oxidize or break down and change chemically in service. Most refiners have their own oxidation test which they favor and use for their own refinery control. The Sligh test, formerly much used is not so much favored today.

Consequently this most important factor cannot be readily predicted by comparison of the tests of various refiners. The best safeguard is the use of an oil that has in service demonstrated its ability to resist oxidation.

Carbon Residue

When an oil is completely vaporized in the absence of air it leaves behind carbon which can be weighed and reported as a percentage of the original weight. It has been demonstrated frequently that certain oils of high carbon residue may consistently leave less carbon in an engine than certain other oils of lower carbon residue. Consequently the test should not be given too much weight when choosing an oil for an internal combustion engine or for high temperature steam cylinder lubrication. For uses involving low or moderate temperatures the test is of little significance.

Neutralization Number

This test reports the organic acidity of the oil. This type of acidity has little or no effect on metal and has a debatable relation to the service value unless quite high, and then only on circulation system oils coming in contact with heat and water. On new oils it is normally quite low and should not be specified.

Precipitation Number

The measure of solid impurities that can be settled out of a cylinder oil or a residual oil by centrifuge after dilution with a naphtha of standardized solvent power, is known as the Precipitation Number. The reading given is 10 times the actual percentage obtained, based on the original quantity of oil. The test is not ordinarily made on bearing oils. Since the effect of these impurities is not fully known and sometimes appears to be an advantage, the test should be used advisedly.

Saponification Number

This test determines the percentage of compound where the type of compound is known. If the type of compound is not known the test must report results in terms of some known fatty oil as for instance lard.

The above tests are made on oil. Those which follow are used on grease.

Penetration Number

To measure the stiffness of a grease a standardized weighted cone is dropped into the grease and the depth of penetration in tenths of millimeters is read off directly after 5 seconds. The higher numbers therefore indicate the softer greases. This measurement may be made on the grease in its undisturbed or "unworked" state or after being mixed thoroughly in a standard device. This latter gives the "worked" reading. Penetration shows nothing but the stiffness of the grease and as such indicates how readily it can be forced through devices or into the bearing.

A more common way to express the body of a grease is by the numbers 1 to 5, No. 1 being the softest and No. 5 the hardest. These numbers are applied to somewhat varying bodies of different companies and one even reverses the normal meaning of the numbers. Ordinarily a No. 1 grease will have a penetration of around 300 and a No. 5 will show a penetration of about 125.

Viscosity of Oil in Grease

This can be determined by the usual methods after extraction in the laboratory. Ordinarily less of a light oil than of a heavy oil will be required to give the same penetration or body. Since the oil is all that lubricates, this is a matter of some importance. Cheap cup greases contain oils of 100" at 100° F. or even less. Better grades contain a heavier oil, in certain special greases even cylinder oil being used.

Melting Point

This is commonly determined by noting the temperature at which a small coating of grease on the bulb of a thermometer becomes sufficiently fluid to drop off. Melting point is not a criterion of quality and cannot be specified to the supplier without reference to other characteristics. For instance, soft grease cannot be made with a high melting point.

All of the above tests of oils and greases and their exact procedure are described in complete detail in the current American Society of Testing Materials' "Report of Committee D2 on Petroleum Products and Lubricants and Methods of Tests Relating to Petroleum Products"[1]. This report is published annually about September of each year. The A.S.T.M. also issues a litle booklet called "Significance of Tests of Petroleum Products"[2], which explains more fully than we are able to do here the relation of these tests to service values. Anyone truly interested should get these publications to see the extreme detail of apparatus and technique required to get reproducible results.

Summary

The more thoroughly this subject is studied the more definitely it appears that physical and chemical laboratory tests at present do not furnish safe guides in the choice of a lubricant for a particular purpose. The best plan is to rely on a reputable supplier who has had broad and comprehensive experience in the manufacture and application of lubricants. Such a supplier will offer lubricants to the general public only after a careful study of their characteristics, followed by severe tests in service. Recommendations for your mill by such a supplier will be made only after thorough study of your individual problems.

[1] A.S.T.M., 1315 Spruce St., Philadelphia, Pa., Price $1.25.
[2] A.S.T.M., 1315 Spruce St., Philadelphia, Pa., Price .50.

New York To Plant More Trees

ALBANY, N. Y., October 8, 1934.—Officials of the Conservation Department announced last week that the state will continue its tree planting program on reforestation areas this fall despite the fact that the stock for the 1934 planting season has been nearly exhausted. It was said that nearly 11,000,000 trees raised for planting next year will be used with enrolled workers carrying out the program in nine counties. The program this fall will bring the total acreage of reforestation areas planted to nearly 126,500 acres or approximately 10,000 in excess of requirements of the original schedule mapped out several years ago. By the end of fall it is estimated that a total of 37,735,492 trees will have been planted and about 19,000,000 of this number were laid out by unemployed labor. The Conservation Department, however, points out that substantially increased state appropriations will be required.

Analyzing Color According To Its Psychological Attributes

By E. W. Melson[1]

Color science, which has been in the domain of the physicist since Newton discovered that white light could be split up by refraction through a prism into an indefinite number of different varieties, has been undergoing new developments since physiologists and psychologists have been examining the effects and sensations which different colors call forth in the eye.

The physicist acknowledges but one absolute method for the determination and specification of color. This is the spectro-photometric method in which each color is analyzed separately by measuring the actual radiant energy producing the sensation. This reduces the measurements to a simple comparison of the intensity or reflectance of any substance and is the ultimate check in nearly all colorimetric methods.

[1]Bausch & Lomb Optical Co., Rochester, N. Y.

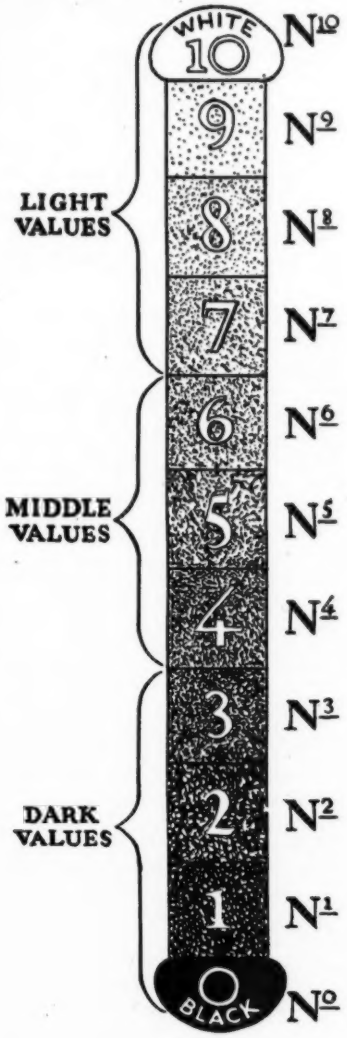

FIG. 1.
Diagram of the Value scale. Note on the left the indication of the three zones, Light, Middle and Dark; and on the right the notation of Neutral at the various leves of Value.

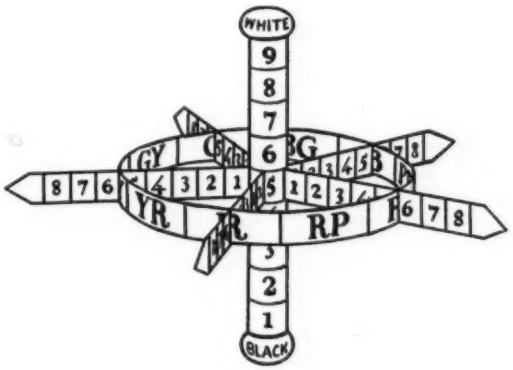

FIG. 2.
Diagram showing Hue, Value and Chroma in their relation to one another. The circular band represents the Hues in their proper sequence. The upright center axis is the scale of Value. The pathes pointing outward from the center show the steps of Chroma, increasing in strength as indicated by the numerals.

However, since Goethe's day other factors than radiant energy have entered into color theories. Goethe challenged the conception of Newton that color belonged to the realm of physics and emphasized the part played by chemistry, and in particular, physiology. The co-operation of the eye and its associated organs in the origin of color is the basic conception in his "Farbenlehre."

Important Advances

More important advances along this line were contributed by Helmholtz, Hering and Fechner, who were all better equipped by scientific training to evaluate the factors involved in the production and sensation of color. Helmholtz selected the physiology of the sense organs as the subject of his researches. He proceeded on the assumption that homogeneous, or monochromatic light rays are the real elements of color vision, and therefore of color theory. After giving appropriate definitions of black, grey and white, in terms of zero, partial and total remission of light, he turns to the question of arranging all colors, and arrives at the following statement: "The color impression made by a certain quantity X of any given mixed light can always be produced by the mixture of a certain quantity of white light E with a certain quantity of a saturated color B (a spectral color or purple) of definite hue." It is thus evident that Helmholtz deduced that hue, purity, and brightness are the three elements of every color.

According to the Young-Helmholtz trichromatic theory of color vision, the retina contains a three-fold nerve apparatus, by the instrumentality of which the sensations of red, green and violet are separately produced. Each of these constituent organs is, however, not merely adjusted

for homogeneous lights, but is stimulated in different degrees of strength by wide ranges of luminous rays.

Munsell's Color System

The validity and applicability of the three-color theory has inspired much of the study in color science which is evident today in such systems as that of Munsell. Munsell decided that the best way to bring about a popular understanding of this subject was to illustrate the three dimensions of color graphically on a color sphere. He therefore planned a series of color charts presenting carefully standardized scales of hue, value and chroma, in which the steps are graduated from neutral gray out to the strongest chroma obtainable in any hue at any given level of value.

Hue is defined as the distinguishing name of any color of the spectrum. Any red is red in hue; the hue is the first characteristic of a color that the eye detects. Value is defined as the lightness or darkness of any color. In terms of value all colors are described as dark, middle or light. Some synonyms in limited use are, brightness, luminosity and brilliance, the latter having the widest usage. Chroma is defined as the strength or weakness of a chromatic color. Two colors may be the same in hue, for instance, both red, and the same in value, that is, neither is lighter nor darker than the other and yet they may be different in color strength. One may be a strong red and the other a weak, grayish red. This difference is in the dimension of chroma, by which the degree of color intensity is measured and indicated. In other words, hue is the name of a color. Value is the amount of light in a color. Chroma is the degree of strength in a color.

A New Color Analyzer

Utilizing the color discs of Munsell, which are satisfactorily permanent, a new color analyzer has been developed in the Scientific Bureau of Bausch & Lomb Optical Company for rapid analyzation of color according to the psychological attributes of hue, saturation, and brilliance. Numerical values are supplied for all three of these attributes so that it is possible to reconstruct and view any given color from numerical data.

Differing from other systems using the Munsell discs,

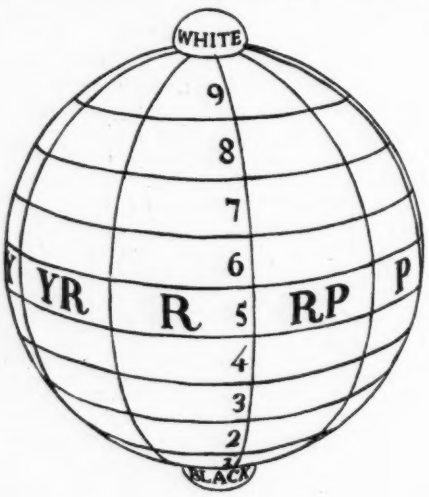

FIG. 3.

The Color Sphere. The Hues are placed in sequence around the Neutral axis. The axis and all the Hues surrounding it are all of the same Value (lightness or Darkness at any given level, increasingly lighter to White at the top and increasingly darker to Black at the bottom. From Neutral gray at the center axis, the Hues increase in color strength or intensity (Chroma) as the distance outward from the axis is increased.

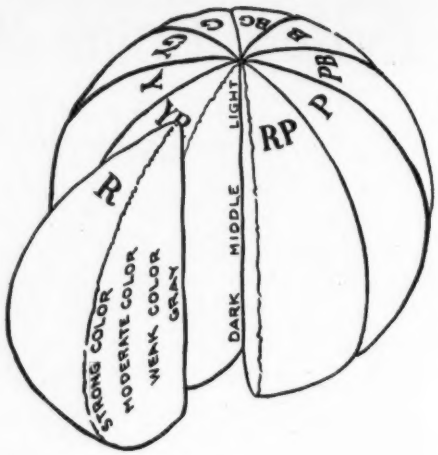

FIG. 4.

An orange assumed to represent the Color Sphere, with a segment displaced to show the Neutral gray center, which is Black at the bottom and blends upward through increasing lightness to White at the top. Note the change in color strength (Chroma) outward from the center.

the new instrument has an optical system designed to avoid actual rotation of the discs for the integration of colors. Formerly these discs were clamped directly to the shaft of a motor and spun. This made it necessary to stop the motor frequently to make tentative adjustments of the discs required for a correct match, the process being repeated over and over again until the proper values were found.

In the left-hand light path of the new color analyzer a prism is placed, the rotation of which causes a circle to be scanned upon the disc surfaces. The prism is mounted in the hollow shaft of an especially designed A. C. induction motor of the shaded pole type. This motor is mounted directly in the optical path and the light beam passes along its axis of rotation. This system secures a quietness of operation which is not attainable by any geared or belted type of motor, and operates at a speed sufficient to eliminate flicker, due to the alternation of brilliance and color.

The prism system, with the proper lenses, gives a circular photometric field divided vertically, but the dividing edge is practically invisible. Light for one half of the field comes from the surface of the Munsell discs, and for the other half from the surface of the sample to be measured. The optical system is so diaphragmed that only light that is reflected from the two surfaces reaches the eye. Both sample and discs are illuminated by specially designed lamp houses directly over each. Each lamp house carries four frosted auto headlight bulbs, the lamps being operated in parallel from an integrally mounted transformer. The lamps are mounted in the form of a square, the reflected beam passing upward through the center of the square to the photometer. The viewing direction is approximately perpendicular to the sample surface. Specular reflection from the illuminated surfaces cannot enter the optical system because the lamps are symmetrically positioned and slightly off the vertical axis. Each group of four lamps is adjustable in a vertical direction for the purposes of balancing the illuminations on the sample plane and the disc plane, or the two groups can be adjusted as a single unit.

Complete Adjustment Quickly Made

With the new system of scanning the stationary discs a complete adjustment is made very quickly, since one

simply views the photometric field and alters the sectors of the four stationary discs until a satisfactory match is secured. The percentage values of the sectors are then read on the graduated circle upon which the discs rest and are used in formulae desired. The revolving disc for quantative color equations is not new, having been used by Plateau and Clerk Maxwell in rapidly alternating hues for mixing uniform colors. Maxwell determined that the angular sizes of the colored sectors could be looked on as numerical values of the amounts of respective colors. The new analyzer, however, reverses previous procedure by using the hollow shaft motor with a scanning prism as the color mixer, without altering the terms of measurement.

The sample table of the color analyzer is square. When liquid materials are being measured, they may be placed in a shallow Petri dish and set centrally upon the sample table, inside the spring clamp. In the optical system on the sample side there is a negative lens mounted in a slide so that it may be introduced into the light path at will. The purpose of this lens is to provide a larger field of view where a sample is of uneven color. With the negative lens out of the system, the specimen field covered is approximately one inch. With the negative lens in, the field covered is about three inches. A daylight filter in the eyepiece of the instrument sets up conditions which closely approximate north skylight.

A Wider Field of Use

The psychological color system has a much wider field of use than the purely physical system because it is more easily interpreted by a greater number of people. There are numberless divisions of industry in which a simple and accurate method of matching colors is desirable. Much of the confusion that exists, where colors are specified but fail to satisfy the buyer because his eye has a different registration from the manufacturer's, can be eliminated by this numerical system.

The new color analyzer will analyze solid material for reflected color. Powders, coarse and fine ground materials, liquids, creams and emulsions, material in sheet form, masses of fibers, and woolen fabrics, are all handled with ease. Even such widely different materials as hay, cotton, coffee, tomatoes, textiles, paper and paint are being successfully analyzed for color by this method.

New S & W High Speed Tuber Delivery

A complete new design of S & W high-speed tuber which has several novel features has recently been delivered to a large paper bag manufacturer for making sample and two wall flour sacks. The makers claim that this tuber runs at speeds faster than ever before thought possible and holds side seam variations to less than 1/16". They also claim that it has the following advantages:

(1) True accuracy over large size range.
(2) Revolving element shows down while paper speeds up.
(3) Thumb lip on plain or seam side.
(4) Operators can work on both sides of table.
(5) Seam variations held to less than 1/16" by electric eye control.
(6) Registers within 1/8 inch from previously printed rolls by means of a full automatic compensator.
(7) A duplex cross paste attachment which is completely built into the machine.

Further information may be had by writing directly to the Smith & Winchester Manufacturing Company, South Windham, Conn.

Dexter Co. Gets $350,000 Loan

[FROM OUR REGULAR CORRESPONDENT]

DEXTER, N. Y., October 8, 1934—Directors of the Dexter Sulphite Pulp and Paper Company voted acceptance this week of a mortgage loan of $350,000 from the Federal Reconstruction Finance Corporation. The application for the loan was approved by the Federal authorities early in September. Several large creditors attended the conference and sanctioned the plans which will be subject to final approval of all creditors at a meeting this week. Negotiations for the loan have been under way for several months with attorneys of the concern attending to important details. It is expected that the loan will become available under terms agreed upon following the meeting of creditors and announcement was made that it would be used mainly to provide working capital. The loan will run for five years and will carry six per cent interest. It was made in accordance with a recent bill passed by Congress authorizing assistance to industry by advancing working capital. The granting of the loan is expected to stimulate general business conditions hereabouts besides insuring continuous operation of the mills and steady employment to 400 hands.

Since the death of Dr. James E. Campbell several months ago the management has been under the direction of Herbert D. Long, for many years secretary of the company. For some time prior to the death of the late Mr. Campbell the affairs of the concern were in such an embarrassed state the creditors agreed to a postponement of payment upon their bills. It was learned that the business has shown considerable improvement and operations have been conducted on a profitable basis for the past several months although a lack of working capital has retarded development to some extent. The government loan is expected to enable the company to do business on the most economical basis by purchasing materials at the most advantageous prices, discounting its bills promptly and thereby making a larger margin of profit. This arrangement will react to the benefit of creditors and the government. The company until the recent depression was regarded as among the most thriving industries in Northern New York.

St. Croix Paper Co. Wins Safety Prize

At the 23rd annual Safety Congress, which was held last week in Cleveland, Ohio, the St. Croix Paper Company, Woodland, Maine, was awarded the major trophy, for the best safety record among 105 paper and pulp mills throughout United States and Canada in competition in the annual National Safety Council Safety Contest which began July 1st, 1933, and ended June 30th, 1934. It also received a first prize from the National Safety Council by virtue of winning the class B championship in the same contest.

During the twelve month period contest, the 370 employees of this Maine newsprint mill worked 765,653 consecutive man hours of exposure without experiencing a single lost-time accident, which together with the previous consecutive no accident hours, dating from September 22, 1931, and those since the close of the 1933-34 contest total more than two million and one quarter safe man hours.

This safety performance is the best on record in the paper and pulp industry. This year's win makes third time that this Down East mill has won the grand prize in the annual National Safety Council contest, having previously won it in 1928 and 1933, as well as winning class awards in those years, and, also, in 1930 and 1931.

Obituary

Howard F. Smith

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 8, 1934—Howard S. Smith, of Montreal, an outstanding figure in the Canadian newsprint industry, passed away on Tuesday last while on a business trip to Cincinnati, Ohio. Mr. Smith, who was in his 55th year, was vice-president and sales manager of the Port Royal Pulp and Paper Company, Ltd., of Saint John, N. B., and formerly general manager of the St. Maurice Pulp and Paper Company, a position he occupied for many years.

Howard F. Smith was a native of Englewood, N. J. Coming to Canada in 1911, in the interest of the Union Bag and Paper Company, he joined the St. Maurice Pulp and Paper Company in 1921 as purchasing agent, a position which he held until the death of Alex MacLaurin whom he succeeded in 1922 as general manager.

When the St. Maurice company was absorbed by the Consolidated Paper group in 1926, Mr. Smith resigned as general manager and, after a period during which he was attached to the sales department of the big group, joined the Port Royal Pulp and Paper Company Ltd., as vice-president and sales manager. In this capacity he took up quarters in Montreal.

The late Mr. Smith was one of the most popular men in the pulp and paper industry to which he devoted all his working life. He was a member of the Engineers Club and of the Summerlea Golf Club. He is survived by his wife, formerly Louise Nellman, and one daughter Betsy.

The funeral took place in Montreal on Friday.

Edward H. Roorbach

[FROM OUR REGULAR CORRESPONDENT]

BROWNVILLE, N. Y., October 8, 1934—Edward H. Roorbach, for many years credit manager of the defunct Harmon Paper Company, died this week following an attack of heart disease. He was 62 years old. He was identified with the Brownville Board Company until 1910, when he accepted a more responsible position with the Harmon Paper Company. His connections with the latter concern lasted for twenty years but he took a position with the Ron-Noc-O Paper Company upon its formation. His wife and several children are the principal survivors.

Corrugated Containers for Milk

A slow but steady development in the use of corrugated containers made from wood pulp and used to protect milk from spoiling or becoming infected from outside courses, is reported by representatives of the Triple Insulaire Company, of Milwaukee. The milk bottle container was developed partially to advertise to home owners the "dead air" principle behind the Triple Insulaire insulation principle. The user of the bottle container simply places the container where it is available for the milkman. The milkman delivers the milk bottle into the container which is reported to protect the product against extreme cold, souring and germ infection. The principle is reported as sound and as attractive to housewives as a method of preventing milk spoilation. If developed, as indicated, the product should become an additional field for the paper industry. Triple Insulaire representatives report that the container is now being manufactured by the Kieckhefer Container Corporation

Indianapolis Optimistic

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 8, 1934—Some spottiness was reported in the local paper market during the last week. However, there is an undercurrent of optimism that will not be downed. The opinion is that during the last quarter of the year demand for standard grades of paper should be particularly active. Virtually all price levels are holding firm.

Local demand for newsprint is unchanged from the week before. The volume as compared with a year ago is somewhat higher and most of the papers are beginning their preparations for the holiday season. The general volume now is slightly below what it was at the opening of the fall season.

The fine paper demand is about as good as had been expected at this season. Most of the demand from factories making Christmas specialties has been filled for the time being but there is a fair demand for paper for catalogues and direct mail literature. This will become heavier as the Holiday season approaches. Book and cover papers are holding their own with some slight fluctuation but generally with a fair level.

Kraft has not been in heavy demand for a week or two but the outlook is favorable for there are not heavy stocks on hand and if buying gets going there should be an immediate reaction. Container factories are operating at about the usual schedules and report sufficient orders to keep busy. Warehouse stocks are not being built up to any great extent. Much the same is true of the box industry. Among these producers there has been a minimum of labor disturbances during the last two weeks something new for nearly a year. In fact no labor lay-offs have been reported for about ten days.

Paper stock men in this section are a trifle more optimistic. There is not such a large mill demand, but there are inquiries that are indicative of some business to come. The rag situation is well maintained. The better grades of paper stock are moving fairly well.

Building papers are more in demand than they were a year ago and the trade is expecting some real business for the spring season.

Norwegian Pulp Industry Improves

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 10, 1934.—The Norwegian pulp and paper industry during the first half of 1934 showed distinct improvement as far as pulp was concerned, but remained highly unsatisfactory in regard to newsprint. Exports of mechanical pulp were approximately 25 per cent higher than during the corresponding period in 1933, and were, as a matter of fact, the highest on record for the period of year. Prices showed a downward tendency, but were fairly well maintained. Exports of chemical pulp increased by 10 per cent compared with the corresponding six months in 1933, the sulphite cartel finding it possible in March to increase prices by 5 shillings per ton. Statistics covering mechanical pulp production are not available, but it is expected that they will show a somewhat larger output than during the first part of last year. A number of plants, especially in southern Norway, closed for short periods on account of water shortage, but in each instance were enabled to resume operations after good rains. The output of chemical pulp reached 171,300 metric tons (metric ton—2,205 pounds) as against 141,800 tons during the first six months of 1933. Production of sulphite pulp continues to be limited to 75 per cent of capacity under the cartel agreement.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Kalamazoo, Mich.—The Sutherland Paper Company, manufacturer of boxboard, bristol board and kindred paperboard stocks, has concluded arrangements for purchase of former local plant and property of the American Signs Corporation. The acquisition comprises a tract of about 6 acres of land, improved with a main factory unit of approximately 50,000 square feet of floor space, fronting on line of the New York Central Railroad. Purchasing company will take over the property at once and will occupy for expansion in storage and distribution departments. At a later date, likely early next year, it is proposed to remodel and equip the building for manufacturing service, including additional building units for further expansion in different operating divisions. L. W. Sutherland is president.

Hackensack, N. J.—The Butterfield-Barry Company, recently organized by David C. and Ralph F. Barry, 149 Clinton place, city, and associates, with capital of $200,000, is said to be planning early operation of local plant for paper converting, primarily for manufacture of line of paper boxes and containers. George Plympton, 7 East Mercer street, Hackensack, is representative for company.

Tampa, Fla.—Bowman-Jenssen, Inc., 3007 Granada street, has taken over building at location noted, and will improve and equip at once for new plant for manufacture of paper boxes and containers of different kinds, as well as cardboard cut-outs and kindred specialties. A list of equipment to be installed has been arranged, including set-up box machinery and accessories. A. J. Bowman is secretary.

Oshkosh, Wis.—The Oshkosh Corrugated Box Manufacturing Company, Harrison and Murdock streets, manufacturer of corrugated paper boxes and containers, is awarding miscellaneous contracts for new addition to plant, recently referred to in these columns, and proposes to have unit ready for occupancy at early date. Award for steel sash has been made to the Concrete Engineering Company, Milwaukee; for lumber and woodwork to the Ross Lumber Company, Chicago, Ill.; and for roofing and other finishing to the E. D. Chase Company, Oshkosh. New structure will be two-story, 92 x 100 feet, brick and concrete, reported to cost over $25,000, including equipment. Fluor Brothers & Smith, 48 Otter street, Oshkosh, are general contractors.

Three Rivers, Mich.—The Three Rivers Waste Paper Company, recently organized as previously reported in these columns, will occupy the local Stowe Mahrle building, which has been purchased by the new company. Improvements will be made and equipment installed at once. It is proposed to provide facilities for employment of about 50 persons. Harold Shilling, 416 Pleasant street, heads the new company.

Chicago, Ill.—The Arrow Corrugated Box Company, 2653 Arthington avenue, has been organized with capital of 250 shares of stock, no par value, to operate a local plant for manufacture of corrugated paper boxes and containers. It is proposed to begin production at early date. Incorporators of new company include Morris Rubin and Arthur Basin.

Cloquet, Minn.—The Berst-Forster-Dixfield Company, manufacturer of pulp products, wood specialties, etc., has work nearing completion on new two-story and basement addition to local plant, and will proceed with machinery installation at once, providing considerable increase in former output. New unit will cost close to $75,000, with equipment. General contract is being carried out by the James Leck Company, 211 South Eleventh street, Minneapolis, Minn. Homan F. Hallock, Oswego, N. Y., is architect and engineer. Company headquarters are at 420 Lexington avenue, New York.

Watervliet, Mich.—The Watervliet Paper Company, manufacturer of coated paper stocks, etc., has adopted a full capacity schedule at local mill, giving employment to regular working force in all departments. It is expected to hold to present basis for an indefinite period.

Chillicothe, Ohio—The Mead Corporation, manufacturer of coated paper stocks, etc., has authorized the immediate rebuilding of four-story experimental laboratory building, recently destroyed by fire, as previously reported in these columns. Plans are being completed. The fire loss approximated $70,000, with equipment, and reconstruction will cost close to like amount.

Chicago, Ill.—The American Envelope Company, West Carrollton, Ohio, manufacturer of commercial envelopes and kindred paper goods, has arranged for lease of space in L. & H. Building, 2626 Washington boulevard, Chicago, totaling about 20,000 square feet of space, and will equip and occupy for new branch paper converting plant. Early operations are planned. James F. Lee, formerly connected with the Chicago Paper Company, Chicago, will be manager of new branch factory.

Covington, Ky.—The Donaldson Lithographing Company, Sixth and Washington streets, is considering extensions and improvements in paper converting plant, with work estimated to cost about $15,000.

Maidenhead, England—Cefoil, Ltd., Maidenhead, Berkshire, manufacturer of cellophane products, is planning early construction of a new experimental plant at Bellochantery, Kintyre, for the production of cellophane from seaweed. The plant will operate under a special process, including chemical treatment of raw material.

Several one-story units will be built, equipped to handle about 10 tons of seaweed per day. At later date, it is proposed to build other structures for large increase in initial capacity. Cost is reported over $75,000, with machinery.

New Companies

Phoenix, N. Y.—The North American Paper Corporation has been incorporated with a capital of 100 shares of stock, no par value, to manufacture and deal in paper goods. A local mill will be operated. New company is represented by Jacob B. Aronoff, 225 Broadway, New York, N. Y.

Milwaukee, Wis.—The Milwaukee Paper Products Company has been incorporated to manufacture and deal in paper goods of various kinds. Incorporators include Isaac Schuster and W. N. Albertson, 735 North Water street. E. G. Wurster, same address, is company representative.

San Benito, Tex.—The Texas Box and Container Company, Inc., has been chartered with capital of $10,000, to manufacture paper boxes and containers of various kinds. Incorporators include J. D. Wade and H. J. Wilson, both of San Benito.

New York, N. Y.—The Eastside Waste Marketing Company, Inc., has been incorporated with capital of 200 shares of stock, no par value, to deal in waste paper, New company is represented by Straus & Osserman, 505 Fifth avenue, New York, attorneys.

Philadelphia, Pa.—The Deco Envelope and Paper Company, 2719 North Reese street, has filed notice of company organization to deal in paper products of various kinds, including commercial paper goods. Company is headed by Milton H. Davis, Jr., 4938 North Front street.

Detroit, Mich.—The Detroit Paper Ruling Company, 851 Porter street, has been incorporated with capital of 1000 shares of stock, no par value, to manufacture and deal in paper products. A. M. Ogur, 4776 Seyburn avenue, is one of the incorporators and company representative.

Wilmington, Del.—Sanitary Tissues, Inc., has been organized with capital of $20,000, under the direction of the Colonial Charter Company, Ford Building, Wilmington, to manufacture tissues and kindred paper stocks.

New York, N. Y.—The Vito Genovese Trading Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to deal in waste paper products. Vito Genovese, 29 Washington park, heads new organization. A. O. Pendolfo, 134 West Houston street, is one of the incorporators.

Evanston, Ill.—Packaging, Inc., 2012 Ridge avenue, has been incorporated with capital of 200 shares of stock, no par value, to manufacture and deal in paper boxes and containers. The incorporators include E. Marks and V. G. Lynch.

Brooklyn, N. Y.—The Rodney Paper and Printing Company has been chartered with capital of 200 shares of stock, no par value, to deal in paper products of various kinds. The incorporators are Edward Baker, 2922 West First street, Coney Island, Brooklyn, and Morris Goldstein, 2317 Cortelyou road, Brooklyn.

New York, N. Y.—The Ohio Distributing Company has been formed with Delaware charter, under direction of the United States Corporation Company, 150 Broadway, New York, with capital of 1000 shares of stock, no par value, to manufacture and deal in paper products.

CONSOLIDATED IMPROVEMENT

(Continued from page 11)

man machinery—the employees—should have every consideration," he said.

Collective bargaining was pronounced by Mr. Barrette as the best way in which to deal with workers. The contracting of labor is the only way, he said, of getting satisfactory relationships and successful understanding between the employer and the employee. Because of the difficulty surrounding the discharge of employees, it is necessary to keep an accurate record of each man so reasons can be specifically set forth.

The fall issue of The Lawrence Alumnus, the quarterly alumni magazine of Lawrence College, Appleton, Wis., is dedicated to the late Lewis M. Alexander, who was founder and president of the Nekoosa-Edwards Paper Company. He was a trustee of the college for many years, served for a long period as president of the board of trustees, and was one of the principal financial benefactors of the college.

Allen Abrams, of the Marathon Paper Mills Company, Rothschild, Wis., was one of the speakers at the annual convention last week of the Wisconsin section of the American Water Works Association. He read a paper on the use of inhibitors in prevention of acid attack on various pipes when muriatic and other acids are used to remove scale. He explained the selection of the proper inhibitor for various types of pipes.

James H. Kimberly, son of J. C. Kimberly, president of the Neenah Paper Company, Neenah, Wis., and Miss Ruth Bishop of Hinsdale, Ill., were married Saturday, October 6, at St. Thomas Episcopal Church of Neenah.

C. R. Meyer, president of C. R. Meyer & Sons Co., Oshkosh, Wis., died last week at the age of 84 years. His company has done most of the construction work for many years for the Kimberly-Clark Corporation, and for many other paper mills in Wisconsin. The company also constructed many dams and bridges. He had been president of the company bearing his name since 1913.

M. & O. Trustees Made Permanent

The United States District Court at Minneapolis, Minn., under date of July 11, 1934, approved petitions filed under the new Federal Corporate Reorganization Act and at the same time appointed Mr. C. T. Jaffray and Mr. R. H. M. Robinson trustees of the estate of Minnesota and Ontario Paper Company, debtor. In accordance with the provisions of the Act the Court's order of July 11, 1934, provided for a hearing by the Court upon the matter of the appointment of permanent trustees. In due course the matter was heard by the Court. The Court has filed its order making permanent the appointment of Mr. Jaffray and Mr. Robinson and adding as a third trustee S. M. Archer of Minneapolis. Mr. Archer is the president of Archer-Daniels-Midland Company.

The Court has also authorized the continuance of Mr. Robinson as business manager for the trustees.

The Court's order of this date continues in full force and effect the powers heretofore granted to the trustees to take over all properties, assets and business of Minnesota and Ontario Paper Company and to manage and operate the business.

The new Corporate Reorganization Act is designed to facilitate the reorganization of corporations. The making permanent of the appointment of trustees is a further step in the proceedings under the Act.

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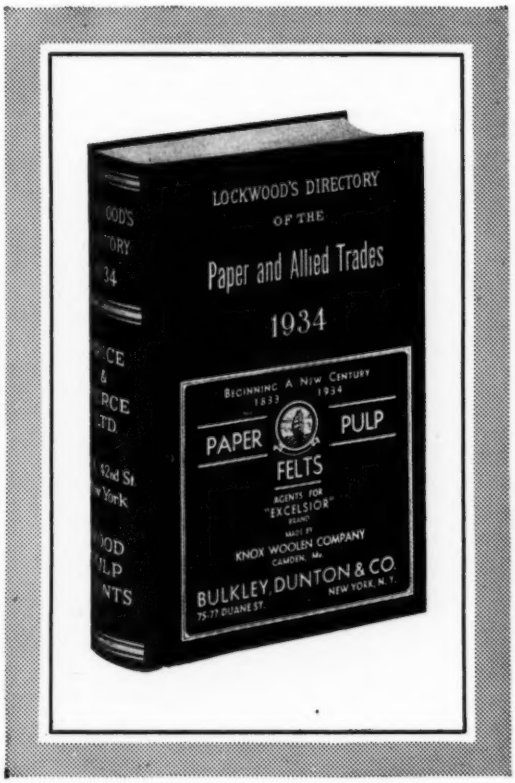

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TRUCE ON INDUSTRIAL WARFARE

The issuance of a proclamation by President Roosevelt declaring a truce on industrial warfare during which the "status quo" of employment relations would be maintained, was urged last week by the National Association of Manufacturers.

At the same time the Association said that "undoubtedly the public recognition by the President in his talk to the Nation that recovery must be based upon the system of fair profit and through the process of individual initiative will be a helpful factor in supplying the confidence in the future which is essential for business progress."

Recalling the patriotic agreement to which Samuel Gompers was a party during the War to maintain existing relationships during the period of the emergency, the Association said:

"The employers of the Nation will welcome the proclamation of a truce similar to that during the War in which neither group, nor the government, will attempt to change existing relationships by force, and challenges organized labor to bring forth a similar acceptance from its convention now in session."

The statement also urged that in the formulation of any future legislation, consideration be given to the system made necessary in Great Britain of making national unions legally responsible in every state for their acts. The text of the statement follows:

"The manufacturing employers of the Nation have been and are now ready to cooperate with President Roosevelt in sound measures to restore cordial employment relations and speed economic recovery.

"Undoubtedly the public recognition by the President in his talk to the Nation that recovery must be based upon the system of fair profit and through the process of individual initiative will be a helpful factor in supplying the confidence in the future which is essential for business progress.

"The President will find employers willing to sit down with him, as he proposes, to devise means for ending the constant series of strikes which have been one of the major obstacles to recovery.

"In July, 1933 the Board of Directors of the National Association of Manufacturers sent to General Johnson a memorandum recommending the issuance by the President of a proclamation similar to the following doctrine laid down by the National Council of Defense during the World War and subscribed to by Samuel Gompers, then president of the American Federation of Labor:

"Neither employers and employees in private industries and transportation systems should attempt to take advantage of existing abnormal conditions and the country's necessities to change existing labor standards in employment relations which they are unable to change under normal conditions.

"Soon thereafter the Industrial Advisory Board of the NRA, composed of outstanding industrialists, signed with the Labor Advisory Board a joint statement which was heralded widely as embodying the patriotic principle of industrial peace under which neither employers nor employees would use the emergency as a lever for fortifying their position.

"Unfortunately, the statement of 1933 was not so accepted by organized labor representatives who signed it. None would contend that unionization of workers was more necessary to combat the depression than it was to win the War. But union leaders have gone ahead steadily calling one strike after another with the sole objective recognition of their unions in which, by their own statements, less than 4,000,000 workers are enlisted.

"The President is assured that employers, with a large stake in recovery, are desirous of seeing this situation ended and they will cooperate to the fullest to obtain peace. They are ready to join, as the President urges, in laying aside the weapons common to industrial warfare, if they must be used at all, until the more normal period following the existing emergency.

"The employers of the Nation will welcome the proclamation of a truce period, similar to that during the War, in which neither group, nor the government will attempt to change existing relationships by force, and challenges organized labor to bring forth a similar acceptance from its convention now in session.

"At the same time, we urge that in the formulation of any further legislation, consideration be given to the system adopted in Great Britian of making unions legally responsible in every state for their acts."

Judging from reports from Washington the President is rapidly carrying into effect his plan for an industrial truce at this time. If he is measurably successful, as he is likely to be, this effort on his part to stimulate recovery will undoubtedly aid more than anything which has been attempted in a long time.

Employment in Paper Bag Factories

WASHINGTON, D. C., October 8, 1934.—Wage-earner employment in establishments engaged primarily in the manufacture of paper bags (exclusive of those made in paper mills) increased from March to September, 1933, according to a report compiled from a preliminary tabulation of data collected in the Biennial Census of Manufactures taken in 1934, released today by Director William L. Austin, Bureau of the Census, Department of Commerce. The figures for the final months of the four quarters of the year show 6,908 wage earners at work in March, 7,405 in June, 8,656 in September, and 7,863 in December.

The value of the paper bags made in the industry in 1933 amounted to $46,164,912 (at f.o.b. factory prices), a decrease of 7.9 per cent as compared with $50,120,652 reported for 1931, the last preceding census year.

Statistics for 1933, with comparative figures for 1931, are given in the following tables. All figures for 1933 are preliminary and subject to revision.

TABLE I.—SUMMARY FOR THE INDUSTRY: 1933 AND 1931

	1933	1931
Number of establishments	96	95
Wage earners (average for the year) [1]	7,572	6,836
Wages [2]	$5,812,998	$6,422,669
Cost of materials, fuel, and purchased electric energy [3]	29,295,547	33,426,725
Products, aggregate value [3]	49,379,367	54,290,800
Paper bags, total value	$46,164,912	$50,120,652
Kraft	38,203,024	40,333,794
Other	7,961,888	9,786,858
Other products	3,214,455	4,170,148
Value added by manufacture [3]	20,083,820	20,864,075

[1] Not including salaries officers and employees. Data for such officers and employees will be included in a later report. The item for wage earners is an average of the numbers reported for the several months of the year. In calculating it, equal weight must be given to full-time and part-time wage earners (not reported separately by the manufacturers), and for this reason it exceeds the number that would have been required to perform the work done in the industry if all wage earners had been continuously employed throughout the year. The quotient obtained by dividing the amount of wages by the average number of wage earners can not, therefore, be accepted as representing the average wage received by full-time wage earners. In making comparisons between the figures for 1933 and those for 1931, the possibility that the proportion of part-time employment was larger in one year than in the other should be taken into account.

[2] Manufacturers' profits or losses can not be calculated from the census figures because no data are collected for certain expense items, such as interest, rent, depreciation, taxes, insurance, and advertising.

[3] Value of products less cost of materials, fuel, and purchased electric energy.

TABLE 2.—WAGE EARNERS, BY QUARTERS: 1933 AND 1931

(The figure given for the final month of each quarter is the total number of wage earners on the pay rolls for the week including the fifteenth day of the month, or for some other representative week in the month.)

Census year	March	June	September	December
1933	6,908	7,405	8,656	7,863
1931	6,750	6,823	6,784	6,625

Data Amendment to Paper Distributing Code

WASHINGTON, D. C., October 10, 1934.—Objections or suggestions concerning a proposed amendment to the paper distributing trade code, submitted by the Code Authority, should be filed with Deputy Administrator Frank H. Crockard by October 13, the National Recovery Administration announced.

The proposed amendment would provide for accurate industry data to be filed with the confidential agency of the Code Authority, together with price schedules.

J. P. Lewis Co. Makes Improvements

BEAVER FALLS, N. Y., October 8, 1934—Extensive improvements are under way by the J. P. Lewis Company which will allow an increase in the manufactured product. A new system is being installed which when completed will furnish pulp in a liquid state from the pulp mill of Lewis, Slocum & Lefevre direct to the paper mill situated at the lower end of this village.

New Bleaching Process for Colored Broke

Paper mills producing colored paper generally cannot escape producing a considerable amount of colored broke with each run on a specific order, or a particular colored stock. This broke is usually stored in or near the beater room in bales, or in a loose condition. It often accumulates to a point where it is a nuisance. The broke products resulting from runs of different colors often get mixed up, and often accumulate in a troublesome quantity.

Virginia Smelting Company of West Norfolk, Va., is offering the paper mills a simple chemical product called Vasite, which when furnished to the beater will quickly destroy the color in a great majority of these broke products. The application is very simple and quick, and can be made at small expense. The use of this decolorizing process enables the paper mill to use the broke of various colors at one time, and to produce from it a reasonably white paper, or a paper dyed to any desired shade. Vasite is produced by its users as needed.

To get the best decolorizing results, it is desirable to heat the pulp to boiling in the beater within thirty minutes. This can be accomplished in an ordinary beater with the addition of a suitable steam supply.

The destruction of colors can be made complete in all cases except where Chlor-amine yellow and Safranine occur.

Color that is destroyed by this Vasite treatment is permanently destroyed. It does not return on standing.

A somewhat similar treatment of textile fabrics, wool, cotton and rayon, with Vasite has been extensively used in this country and abroad following Virginia Smelting Company's patents. Vasite, which is a solution containing hydrosulphite, has proved through years of experience a most efficient decolorizing agent in the textile field.

Virginia Smelting Company is now extending its decolorizing operations to the paper trade, and believes that this treament will prove a very real help to paper mills specializing in colored stocks.

Finnish Pulp Market Satisfactory

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 10, 1934.—The Finnish pulp and paper market has been satisfactory so far as sales are concerned, according to Consul Cyril L. Thiel, Helsingfors. Wood pulp exports have continued to increase and prices have, on the whole, been steady. The market for paper and boards has on the whole been better than last year. Consumption has increased appreciably in the case of newsprint and prices have tended upwards. In view of the rising raw material costs, however, these increases have so far been inadequate. The kraft paper market improved to some extent, but prices did not change. To stimulate the market, the Skankraft Manufacturers Association, to which Finnish producers belong, has announced its decision to reduce the output of kraft paper by ten per cent.

Paper Makers Machine Builders Industry

The National Recovery Administration last week announced the approval and authorization of the Trade Practices Complaint Committee for the Paper Makers Machine Builders Industry, as follows:

E. H. Neese, president Beloit Iron Works, Beloit, Wis.; C. W. Valentine, president, Bagley & Sewall, Watertown, N. Y.; George Sumner Barton, president, Rice, Barton & Fales, Inc., Worcester, Mass.

A drawing made at one of our plants by D. Douglass

these six plants are located to give you quicker service on *Rosin Size*

American Cyanamid is developing a better and more complete service for the paper industry. We are keeping in step with the increasing demand for closer cooperation . . . quicker delivery of all orders.

That is why our rosin size plants are located where they will be most convenient to the companies they serve—why, in every center of the paper making industry you will find an American Cyanamid Rosin Size plant or warehouse.

Below is a list of our up-to-date, fully stocked Rosin Size plants. Note the location of the one nearest to *you*. And when you need rosin size, remember—our service includes not only prompt attention to every order but full cooperation on special problems of production. These plants, serviced by our own tank lines, are located at:

Waterbury, Connecticut; Erie, Pennsylvania; Kalamazoo, Michigan; Valdosta, Georgia; Pensacola, Florida; De Quincy, Louisiana.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Paper Specialties

Process for the Preparation of Plaster for Stone Work, Cement and Similar Materials. S. J. Benneter, Oslo. Nor. pat. 53,321 (Nov. 16, 1931).—The plaster consists of a mixture of finely pulverized earths, such as kaolin, asbestos, as well as pulp.—J. F. O.

Process for Gluing Together Plates of Fiberous Materials of Various Specific Volumes. A. Bol. Svenska Maskinverken, Sodertalje. Swed. pat. 79,363 (May 24, 1929).—The surfaces coming together are roughened by rasping after being previously treated with a solution of sodium hydroxide; and then coated with a solution of water glass or some other suitable binding material. And lastly the plates are pressed together.—J. F. O.

Process for Strengthening and Water-proofing of Molded Fiber Containers, Molded Fiber Bottles and Similar Molded Objects by Impregnating with Materials Which Fills the Pores. Werner Dautwitz, Zurich. Ger. pat. 594,118 (Aug. 31, 1928).—The sizing is carried out so that the pores remain open and a coating of paraffin, wax or similar substance is given to the moulded fiberous object.—J. F. O.

Process for the Pouring and Pressing of Plates from a Suspension of Wood Fibers. Jacob Fahrni, Zurich. Ger. pat. 589,383 (Feb. 25, 1932).—J. F. O.

Process for the Production of Staple Fibers from Ramie Stalks. Emil Gminder, Reutlingen. Ger. pat. 592,736 (June 7, 1932).—Method for increasing the yield of fiber.—J. F. O.

Process for the Production of a Fiberous Material Suitable for the Manufacture of an Absorptive Paper Capable of Parchmentizing. I. G. Farbenindustrie Akt. Ges., Frankfurt a.M. Ger. pat. 592,741 (Feb. 27, 1930).—Rags, soda pulp or similar materials are drenched with an alkaline solution, the excess liquor drained off, and the rags then allowed to age for several days at ordinary temperatures and with access to the atmosphere. The material is finally cooked with dilute alkali in a spherical boiler.—J. F. O.

Process for the Manufacture of Pressed Plates or Objects of Fibers. L. B. Schibbye, Sbartvik, Sweden. Finn. pat. 15,493 (Feb. 15, 1932).—Pulp fibers mixed with fibers produced by mechanical processes is mixed with causticized sludge, then pressed and dried in the usual manner. A binding material or a fire-proof material can be added if desired.—J. F. O.

Composition Roofing Material. Norman P. Harshberger assignor to Bakelite Building Products Co. U. S. pats. 1,943,257 and 1,943,258 (Jan. 9, 1934).—*No. 1,934,257.*—A sheet of felt is treated with a solution of starch which, when dry, will form a smooth coating on the fibers of the felt; a bituminous waterproofing material is then applied to the treated felt, which quickly penetrates to the fibers of the sheet. *No. 1,943,258.*—Roofing and siding elements are produced by impregnating a fibrous roofing material with a starch-containing liquid responsive to heat and pressure to maintain the material in a desired form, forming the material into curved shapes by the application of heat and pressure, and applying to the stiffened material a weatherproofing bituminous substance capable of continuously withstanding outdoor weather conditions.—A. P.-C.

Composite Hard Fibrous Panels. Treadway B. Munroe and Elbert C. Lathrop assignors to The Celotex Co. U. S. pat. 1,942,723 (Jan. 9, 1934).—A base portion is formed of fibrous material such as bagasse, wood or cornstalk, fiber heterogeneously arranged, having a moisture content of about 50%, with a surfacing sheet carrying a design secured to the base portion by use of heat and pressure and an adhesive such as a synthetic resin.—A. P.-C.

Marking Bitumen-Saturated Felt. William R. Menshon assignor to The Barrett Co. U. S. pat. 1,942,763 (Jan. 9, 1934).—Before saturating roofing felt with bituminous material, it is provided with markings formed with a suspension of a metallic powder such as aluminum in a dilute silicate solution.—A. P.-C.

Absorbent Felt. Joseph E. Plumstead assignor to Jessup and Moore Paper Co. U. S. pats. 1,947,103 to 1,947,108 (Feb. 13, 1934).—*No. 1,947,103.*—For producing an absorbent felted product suitable for use with waterproofing agents, a finished or prepared cellulosic fibrous pulp is used which has been previously cleansed by neutralizing and dissolving the cementing intercellular substances, and the pulp is treated with a fiber curling or kinking agent such as caustic soda and an auxiliary agent

such as sodium sulphide or a copper or zinc compound which improves the activity of the curling or kinking agent. *No. 1,947,104* relates to a process in which artificially curled or kinked fibrous material impregnated with a copper compound is further treated with an ammonia compound to form a mucilaginous coating on the fiber simultaneously with the production of the felted sheet, to obtain a finished product of increased strength. *No. 1,947,105* relates to a process in which finished or prepared cellulosic pulp is treated with sodium sulphide solution, producing kinking, curling or crimping of the fibers (previously cleaned of cementitious intercellular substances). *No. 1,947,106* relates to a process in which pulp is showered with a treating solution and shredded and defelted in the presence of the solution, screened to separate excess solution, and passed between press rolls for further removal of solution. *No. 1,947,107* relates to a process for accelerating the kinking, curling and crimping of the fibers by bruising them (suitably by the action of a ball mill) at one or more points of their length, and treating the fibers with a solution such as soap, caustic soda, sodium sulphide, zinc chloride, etc., to effect selective or pronounced reactivity at the bruised points and consequent accelerated curling of the fibers. *No. 1,947,108* relates to a process of curling fibers for making absorbing paper by building up a layer of the pulp on the wall of a centrifuge and flushing caustic soda solutions of non-mercerizing strength through the fibers.—A. P.-C.

Felted Sheets of Artificially Crinkled Cellulose Fiber. Frank H. McCormick and George L. Schwartz assignors to E. I. du Pont de Nemours and Co. U. S. pat. 1,944,907 (Jan. 30, 1934).—Sheets suitable for making artificial leather are formed of felted artificially crinkled cellulose fibers impregnated with a mixture of drying oil and bituminous material, the fibers having a freeness of 15 to 40 sec. and having the substantially circular form in cross section such as characterizes material treated with solutions of caustic soda of mercerizing strength.—A. P.-C.

Artificial Fabric. George L. Schwartz assignor to E. I. du Pont de Nemours and Co. U. S. pats. 1,945,537 and 1,945,538 (Feb. 6, 1934).—*No. 1,945,537*—Material such as may be produced by dispersing paper pulp with 8 to 35 per cent caustic soda solution at room temperature and promptly washing out the alkali, is used in making sheets of artificially crinkled fibrous cellulosic material in which starch is absorbed and which are flexible, exhibit very little paperbreak, and are strongly resistant to tear and suitable for use in bookbinding and for various other purposes. *No. 1,945,538* relates to similar sheet material impregnated with rubber latex and coagulated.—A. P.-C.

Copperized Paper. William R. Barber, Albert G. Natwick and Maurice W. Phelps, assignors to Crown Willamette Paper Co. U. S. pats. 1,947,451 and 1,947,452 (Feb. 20, 1934).—*No. 1,947,451*—Paper sheets are made of fiber carrying a precipitate of copper ortho-phenylphenate which serves to adapt the paper for covering plants or wrapping fruits. *No. 1,947,452* relates to paper containing copper resinate precipitate in its fibers.—A. P.-C.

Tracing Paper. Harold M. Spurlin assignor to Hercules Powder Co. U. S. pat. 1,946,338 (Feb. 6, 1934).—A material capable of receiving ink, substantially transparent and waterproof and free from greasiness, comprises a thin sheet of substantially porous paper impregnated with and superficially coated with a composition containing nitrocellulose and a plasticizer such as tricresylphosphate, etc.—A. P.-C.

Artificial Leather. Frank O. Woodruff assignor to Beckwith Manufacturing Co. U. S. pat. 1,945,173 (Jan. 30, 1934).—A multi-ply sheet of fiber such as leather fibers and cellulosic fibers is formed containing rubber latex coagulated not only in the plies but also between the individual plies as a film serving to integrate the plies, the film being substantially continuous with the latex coagulated with the plies.—A. P.-C.

Treated Paper for Preventing Tarnishing of Silverware. Arthur E. Thurber and Raymond H. Sholtz assignors to Oneida Community, Ltd. U. S. pat. 1,946,508 (Feb. 13, 1934).—Copper sulphate is added to paper pulp to precipitate the sulphur in an inactive form. The paper formed does not tarnish silver and other tarnishable metals.—A. P.-C.

Manufacture of Open Space Coated Abrasive Paper By Use of Paraffin or Other Hydrophobic Materials. Frank J. Tone assignor to Carborundum Co. U. S. pat. 1,941,962 (Jan. 2, 1934).—Certain portions of fabric such as paper are coated with paraffin or other hydrophobic material; the whole surface is then coated with an adhesive mixed with abrasive grains and the coating is subsequently brushed or scraped from the initially coated areas.—A. P.-C.

Paper Making. Charles I. Goessmann. U. S. pat. 1,944,886 (Jan. 30, 1934).—Raw paper stock is impregnated with a nitrogenous celloid, and laminations are immediately formed out of the impregnated stock prior to solidification, the laminated stock is chilled, then impregnated with fixing agent such as alum or a chromate and the product is dried.—A. P.-C.

Process of Protecting Fibrous Products. Fergus A. Irvine. U. S. pat. 1,942,706 (Jan. 9, 1934).—A toxic substance such as arsenious oxide in dry finely divided form is added to the stock before felting on the paper machine.—A. P.-C.

Paper Tube for Shot Shells. Watson H. Woodford assignor to Remington Arms Co. U. S. pat. 1,943,501 (Jan. 16, 1934).—A paper shot-shell tube is rendered waterproof and charproof by first immersing it in a solution having char-preventing and lacquer-plasticizing properties, such as castor oil, and then dipping the tube in a solution comprising a solution of a lacquer base such as nitrocellulose in a solvent such as acetone to form a lacquer coating on the tube.—A. P.-C.

Protecting Printed Documents. Joseph Broadman. U. S. pat. 1,947,516 (Feb. 20, 1934).—An additional flexible sheet of light-permeable material such as transparent paper is connected to each side of a sheet of printed paper by means of an intermediate layer of adhesive such as a cold-water wheat-flour paste which is caused to enter and penetrate only the inner part of the additional sheet material; the exterior surface of the additional sheets is then coated with a layer of light-permeable protective material such as Manila gum varnish which penetrates only the outer portion of the sheet and is of flexible and non-peeling resinous character.—A. P.-C.

Building Material and Method of Producing It. Frank H. Gilchrist assignor to The Patent and Licensing Corp. U. S. pats. 1,958,571 and 1,958,572 (May 15, 1934).—A layer of "mastic material" (*e.g.*, a mixture of bitumen fibrous material and fillers such as crushed slate, sand, cork, etc.) is extruded from a flat wide orifice and applied to a somewhat narrower web of impregnated roofing felt or composition board. The combination is passed through a pair of embossing and cutting rolls which emboss a design simulating brick siding and simultaneously cuts the web into panels and trims off the edges of "mastic" leaving projecting tabs without the underlying felt.

No. 1,958,571 covers the article and *No. 1,958,572* the method of producing it.—A. P.-C.

Impregnated Sheet Product. George A. Richter assignor to Brown Co. U. S. pat. 1,958,976 (May 15, 1934). —A felt is made from unbeaten, unbleached pulp, preferably purified to a 93 to 96 per cent alpha-cellulose content, and a portion of which has been mercerized. The felt is impregnated with bitumen (to make roofing paper) or rosin (for shoe stiffeners).—A. P.-C.

Apparatus for Manufacturing Insulation Board. Ralph V. Grayson. U. S. pat. 1,958,819 (May 15, 1934).—Loose insulating fiber (*e.g.*, fireproofed cotton, mineral wool, etc.) is applied to both sides of a web of corrugated board and compressed into intimate contact therewith, and a facing sheet is applied to each side of the corrugated core.—A. P.-C.

Absorbent Material and Method of Making the Same. Errold B. Thomas. U. S. pat. 1,959,845 (May 22, 1934). —Absorbent wadding is formed by disintegrating a substantially dry sheet of wood pulp by means of a toothed wheel mounted in an enclosed space so that the shredded material is delivered against a pair of co-acting, rotating, screen-covered cylinders the inside of which is connected to a source of vacuum, thus forming a thick, bulky layer of fiber.—A. P.-C.

Method of Imparting Elasticity or Strength to Paper. Harold Jackson. U. S. pat. 1,959,956 (May 22, 1934).—A paper web is provided with a positive crinkle or corrugation by passing it between two elastic longitudinally ribbed belts, expanding the belts transversely at the feed and to flatten out the ribs and allowing them to contract progressively to the delivery end, so that the web is narrowed and constrained to crinkle uniformly by being pressed by the ribs of one belt into the grooves of the other.—A. P.-C.

Ornamental Paper. Floyd R. Graham assignor to American Tissue Mills. U. S. pat. 1,958,750 (May 15, 1934).—Ornamental paper is produced by fluting the opposite longitudinal sides only of superposed strips of creped paper to provide strips having relatively flat, central, non-fluted sections and flexible distorted edge portions, the fluted sections comprising alternate ridges and grooves extending parallel to the crepings.—A. P.-C.

Crepe Paper. Gardner R. Alden assignor to Dennison Manufacturing Co. U. S. pat. 1,958,411 (May 15, 1934).—Fireproofed crepe paper having a high crepe ratio is produced by wetting a web of paper with a suitable adhesive creping solution, applying the wet surface of the sheet firmly to a creping roll, treating the exposed surface of the paper with a fireproofing solution, and stripping the the sheet from the roll by means of a creping doctor.—A. P.-C.

Moisture Resistant Fibrous Material. Paul C. Seel assignor to Eastman Kodak Co. U. S. pat. 1,957,912 (May 8, 1934).—A moistureproof wrapping paper is obtained by impregnating tissue paper with a mixture of an acetone-soluble cellulose acetate having a precipitation value of at least 90 per cent and ortha-cresyl toluene sulphonate. A precipitation value of 90 per cent means that the cellulose acetate is hydrolyzed to a point where, after separating from the hydrolyzing solution, about 90 per cent precipitates in a mixture of 40 per cent water and 60 per cent acetone by volume.—A. P.-C.

Shot Shell. Charles E. Burke assignor to E. I. du Pont de Nemours and Co. U. S. pat. 1,957,935 (May 8, 1934).—The surface of the paper is treated with a cellulose ether composition, either before or after forming into a shell, and the latter is then dipped in hot paraffin. —A. P.-C.

Manufacture of Cellulose Products. George A. Richter assignor to Brown Co. U. S. pats. 1,959,965 (May 22, 1934) and 1,960,551 (May 29, 1934).—*No. 1,959,965* —Dry bleached pulp is treated in a ball mill to effect partial pulverization, without appreciable hydration, so that part of the material is finer than 30- or 40-mesh. The treated material may be made into paper, with or without beating; or the coarse portion may be separated from the finer, beaten, mixed again with the fine material, and made into paper; or the separated fine material may be used for coating paper. *No. 1,960,551*—This invention is generally similar to the previous one; but pulverization is carried out in the presence of water after mercerizing the pulp to prevent hydration in the ball mill or in the beater, or else pulverization is carried out in the presence of a non-aqueous liquid (such as benzol) which can readily be volatilized from the cellulose powder.—A. P.-C.

Mechanism for An Improved Method of Forming Pulp Articles. Albert W. Morris assignor to George E. Coblens. U. S. pat. 1,955,249 (April 17, 1934).—This is an improvement on U. S. pats. 1,839,766 and 1,757,205. It provides that molds which have relatively deep depressions and are made with electric heating resistances shall be built of a series of assembled plates with intermediate insulating members.—A. P.-C.

Pulp Yarn. Milton O. Schur and Benjamin C. Hoos assignors to Brown Co. U. S. pat. 1,955,567 (April 17, 1934).—The annular mass or cake of strand material in the spinning pots is sprayed with caustic soda solution of mercerizing strength, washed with water and dried. —A. P.-C.

Corrugated Board Suitable for Shipping Containers, Etc. Charles L. Keller assignor to The Richardson Co. U. S. pat. 1,949,255, (Feb. 27, 1934).—A corrugated board is formed with at least one inner ply and at least one corrugated filler ply formed from the felted product of a pulp containing asphalt in minute uncoated particle and vegetable fibers in intimate and stable relation, consolidated under heat and pressure.—A. P.-C.

Method of Making Waterproof Fiber Board. Edwin J. Eimer assignor to Gagnier Fibre Products Co. U. S. pat. 1,953,397 (April 3, 1934).—In a multiple-ply board the furnish of the central plies or filler contains a suitable water-proofing agent in finely-divided solid form. After the board has been formed and dried it is treated with a suitable solvent of the waterproofing material so as to cause the latter to dissolve, thus impregnating the board and acting as an adhesive to hold the liners to the filler. The solvent is then evaporated.—A. P.-C.

Machine for Making Boards. Henri P. L. Laussucq assignor to Birdsboro Steel Foundry and Machine Co. U. S. pat. 1,953,240 (April 3, 1934).—The patent covers a large number of mechanical features in the design and construction of presses for forming sheets of board.—A. P.-C.

Cellulose Board. William A. Darragh. U. S. pat. 1,955,411 (April 17, 1934).—This patent covers the board made on the machine described in Darragh's U. S. pat. 1,819,771, of August 18, 1931.—A. P.-C.

Sound Deadening Board and Process. Francis L. Carson assignor to The Pacific Lumber Co. U. S. pat. 1,956,091 (April 24, 1934).—A thick, loosely-matted board made of long shredded or otherwise separated redwood bark, is faced on both sides with a paper liner by applying hot asphalt or pitch to one side of the liner, immediately cooling to prevent deterioration of the paper, and pressing into contact with the board by means of rolls that are heated to soften the pitch or asphalt sufficiently to secure adhesion to the board.—A. P.-C.

Early Pulp and Paper Mills of the Pacific Coast*

By Ralph M. Snell[1] and B. T. McBain[2]

Everybody's Cyclopedia says, in part, regarding San Francisco, California: "As early as 1769 a number of Franciscan fathers established a mission here and seven years later the Spaniards chose the place for a military post.

"In 1835 an Englishman erected the first tent on the site of the present city in 'Yerba Buena,' three miles from the mission. A village which soon grew was united with the mission in 1846. Two years later, gold was discovered and by 1850 San Francisco had a population of 25,000."

The map of the first survey of the city of San Francisco was filed at the United States Land Office in Oregon City, Ore., early in 1850, then the only recording land office on the Pacific Coast. That map is still on record there.

California was admitted to the Union, September 9th, 1850.

The same cyclopedia says that the Columbia River was discovered in 1792 and in 1811 Astoria, at the mouth of the river, was founded by the American Fur Company.

By 1839 people began to migrate West overland and on March 3rd, 1849, the Oregon Territory was formed, which included all the country between California and British Columbia, the Pacific Ocean and what is now the state of Idaho.

The State of Oregon was admitted to the Union February 14, 1859. However, before this happened the Oregon country, or Oregon Territory, was again divided into Oregon and Washington Territories on March 2, 1853, when Washington Territory was formed.

Portland, Ore., founded in 1844, was named after Portland, Maine.

The State of Washington was not admitted to the Union until November 11, 1889.

While Astoria was the first settlement of white men in the Oregon Territory, still Oregon City was the political center as early as the late 1830's. John McLaughlin, the father of Oregon, had his home there and it was to Oregon City that the whole Pacific Coast looked for a Federal Land Office until after 1852. He founded Oregon City in 1829.

It was in 1852 that the first permanent settlers came to the vicinity of what was later named Seattle in Washington, and it was not until three years later that 150 people had settled there. However, today Seattle is the largest city of the Pacific Northwest with 376,500 people, while Portland, Ore., is credited with 311,100 by 1932 estimates of the U. S. Census.

Most of the ships for the Alaskan rush in 1897 started north from Seattle through the inland passage between the mainland and Vancouver Island in British Columbia.

It has also been stated by early pioneers that the first covered wagons to reach Oregon crossed the Willamette River by raft from the West side, embarking at a point near the site now occupied by the Crown Williamette Inn, landing in the northern section of Oregon City on the flat near the Clackamas River.

The above early history of the Pacific Coast, in brief, is recited to show that the Pacific Coast paper industry dates back almost to the beginning of the white men's time out here "where the West begins."

Today the three Pacific Coast states have about nine million poulation, the 1930 census showing California with 6,062,000, Oregon with 983,000, and Washington 1,599,000, a total of 8,644,000, which have been increased by the 1932 estimates to about 9,000,000.

The markets of Pacific Coast made paper are the markets of the world. However, the state reached by as low or better freight rates as from other paper making districts are, Arizona, California, Colorado, Idao, Montana, Nevada, Oregon, Oklahoma, Texas, Utah, Washington and Wyoming, a total of nearly 21,000,000.

First Paper Mill West of Rockies

The first paper mill West of the Rocky Mountains was built in Utah and made paper by hand in Salt Lake City in 1854. The first machine made paper in Utah was not manufactured until July 24, 1861. This mill was built by a man named Howard, who was born in England and who came to America after learning the paper making trade in his home country. Brigham Young, the organizer of the Mormon Church, put Howard to work building a mill for hand-made paper, but while the work started in November, 1852, no paper was actually made until June 27, 1854.

The mill for machine-made paper, started in 1861, was operated until April 1, 1893, when it was burned. No paper is now made in Utah.

Superior Facts (October, 1930), says in part: "Utah has contributed a few important and amazingly interesting pages to the history of paper making. Back in the period 1860 to 1893, the Mormons in an arduous struggle to obtain paper for the publication of their newspapers, established two paper mills. . . .

"Their efforts to produce paper were identical with their struggle for existence. Records tell that when paper could not be obtained, or was lost in an 800-mile overland haul by oxen or mule team through hostile Indian country, that they pounded to a pulp rags in crude stone mortars, felted it into sheets without wire molds or press felts and dried it in the sun in order to publish their paper."

The same publication (May, 1932), gives the record of Thomas Howard, the pioneer paper maker of Utah. His ancestors on both sides were paper makers for many generations in Great Britain. He embarked on a sailing vessel at Liverpool March 4, 1851, landed in New Orleans, and from there went by boat to Council Bluffs, thence by ox teams across the plains, reaching Salt Lake on October 1, 1851. During the next month, November, the first attempt to build a paper mill was made on Mill Creek, six miles south of Salt Lake City. However, this attempt was given up in February, 1852. In the following year, 1853, with the loan of some sugar machinery and a water power on Temple Block, in Salt Lake City, the second effort was made. This time with success, and Mr. Howard and a Thomas Hollis made the first paper by hand June 27, 1854. Mr. Howard says:

"We made newspaper on which 'Desert News' was printed wrapping paper for the stores, board for paper boxes, and what were most in demand, boards for the women's sun bonnets.

"In the year 1860, Brigham Young purchased a 36-inch cylinder paper machine in Philadelphia. . . . Finally all was

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* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Portland, Ore., Sept. 10 to 13, 1934.

[1] Member TAPPI (deceased), Vice President, Hurlbut Paper Company, South Lee, Mass.

[2] Member TAPPI, Consultant on Pulp and Paper Plant Problems, Portland, Ore.

in readiness and on July 24, 1861, I made the first paper by machinery.

"This mill continued with indifferent success until the year 1863, when the machinery was moved to the Granite mill, which had been built at the mouth of the Big Cottonwood Canon, 13 miles from Salt Lake City. The mill was moved owing to the failure of the water power at the old site. . . .

"In addition to the old machinery, a new 66-inch fourdrinier machine, six rag machines, each with a capacity of 1,000 pounds of rags, a rotary boiler, together with all the recent improvements, were placed in the mill at the new site. . . . It had a capacity of five tons of paper every 24 hours."

This mill continued in operation until April 1, 1893.

First Pacific Coast Mill

The first paper manufactured on the Pacific Coast was made at the Pioneer Mill on San Geronimo Creek (Paper Mill Creek), 12 miles north of San Rafael, Marin County, Cal. The mill was built by S. P. Taylor & Co. in 1856 and was on the North Pacific Coast R. R. This mill was enlarged from time to time, and finally a new mill was built with larger machines, the two mills being operated by the Taylor Company until the early nineties.

A part of F. G. Wight's article in *Superior Facts* October, 1928, "Paper Progress on Pacific Coast," reads:

"The original paper mill on this coast was erected by S. P. Taylor at Taylorville, Marin County, Cal. Prior to the erection of this mill all paper consumed on the Coast came around Cape Horn on sailing vessels, and by reason of irregularities in sailing dates, and the perils of the sea, paper famines were not of infrequent occurrence.

"It has been related that on occasions the publishers of the newspapers were reduced to the necessity of printing on brown straw, or on any other wrapping paper that they were fortunate enough to secure. On one occasion Mr. Fitch, one of the proprietors of the *San Francisco Bulletin*, entered the office of Mr. Taylor on Clay street with his old-fashioned stove-pipe hat in his hand. In it he carried a lot of gold dust and $50 in gold slugs. He dumped it on Mr. Taylor's desk and begged him to make some paper for the *Bulletin* with the least possible delay. The question of price or quality did not enter into the transaction. The main issue was to get the paper in time to prevent a failure of the publication to appear on the streets at the proper time."

San Lorenzo Paper Mill at Santa Cruz was started in 1865, according to historical notes available, but there seems no additional information available at this writing.

First Mill in Oregon and Washington

The first paper mill in Oregon was built by Henry L. Pittock, owner and publisher of *The Morning Oregonian*, Portland. The first mill was built in Oregon City and made paper first in October, 1866. It was moved and enlarged in 1868, being placed in a new building with a water power on the Clackamas River, not far from what is now known as Park Place, across the said river from Gladstone, there being an old stop on the Southern Pacific Railroad near Park Place known as "Paper Mill." This mill was put in charge of William Lewthwaite, father of Alex. J. Lewthwaite, later a vice-president of the Crown Willamette Paper Company. William Lewthwaite was also a brother of John Lewthwaite, who built the Mormon Channel Mill for California Paper Company at Stockton, Cal., in 1877-78.

This Clackamas Mill was later moved to Camas, Wash., and made the first paper in Washington Territory on May 5, 1885. This first Washington mill burned down November 7, 1886; was rebuilt and started again May 3, 1888.

In *Superior Facts* March, 1932, appears the following:

"Dating back to the days prior to the use of groundwood and when the delivery of paper to the Pacific Coast from the mills in the East, 3000 miles distant, depended upon spasmodic and uncertain deliveries by sailing vassels around Cape Horn, or by ox teams over the Rocky Mountains, the press of the Pacific Coast was most seriously handicapped.

"Many early attempts were made to manufacture paper on the Pacific Coast, but these efforts were also hampered by infrequent and uncertain deliveries of raw materials from Europe or Eastern United States. Consequently these early paper mills built to produce newsprint were not too successful and most of them turned to the production of brown straw wrappers.

"Possessed of untiring energy and persistence, H. L. Pittock, principle owner of the Pacific Northwest's pioneer newspaper, *The Oregonian*, initiated the successful manufacture of newsprint on the Pacific Coast when he, with a few associates, started the first paper mill in the great Northwest at Oregon City in October, 1866. This mill, producing but 1,500 pounds of paper per day, was largely experimental and had a struggle to exist because of the insufficient and uncertain supply of rags and the imperfect methods of using straw.

"In 1867, this mill was taken over by H. L. Pittock & Co., and a new organization composed of H. L. Pittock, W. W. Buck and the latter's son, H. S. Buck.

"Conditions improved with the importation of Chinese and other Oriental rags, better supplies of chemicals and improved methods of producing bleached straw pulp. Soon the limited facilities of the Oregon City mill were overtaxed and a new paper mill was planned. Mr. Buck owned a power site and sawmill on the Clackamas River and this property was converted to paper making. The Clackamas mill was started in 1868 under the management of William Lewthwaite. Mr. Pittock secured Mr. Lewthwaite from the paper mill at Taylorville, Cal.

First Northwest Wood Pulp at Camas

This mill at Clackamas also proved to be too small for the ever-increasing business and demands upon it, and Columbia River Paper Company was formed to build a mill in Washington Territory. A 78-inch fourdrinier machine was installed and produced about four tons of newsprint per day. Soon after this new mill was started, the Clackamas mill was shut down and the 54-inch machine moved over to Camas, where it made straw wrapping.

This new mill at Camas, Wash., was equipped for the manufacture of groundwood and the *Paper Trade Journal* of May 9, 1885, reported:

"The first wood pulp ever manufactured in the far Northwest was made two weeks ago at the new mills of the Columbia River Paper Company at La Camas, Washington Territory. Cottonwood was used and the pulp manufactured is said to be excellent."

After operating very successfully for over a year, the mill burned. The *Sunday Oregonian* of November 7, 1886, contains the following item:

"Troutdale, Ore., November 7, 1886, 2 A. M. The Columbia River Paper Company's mill at La Camas, Washington Territory, burned to the ground at 10 o'clock last night. It is a total loss, aggregateing $100,000 to $150,000. The amount of insurance is unknown."

Troutdale is on the Oregon side of the Columbia River almost immediately across from Camas, which is now the name of the town originally known as La Camas.

This mill was rebuilt in a more substantial manner and started again May 3, 1888.

The first superintendent was William Lewthwaite. He was followed by a Mr. Dodd from Appleton, Wis. A Mr. Tuerck had charge of the rebuilding of the mill and he was followed by Charles West; then William Sheahan, Fred Fuller, P. J. Lamereaux, Al. Weatherby and so on up into the present generation.

Stockton, Cal., had a paper mill in 1873 built in connection with the R. B. Lane flour mill. In 1877-78 California Paper Company built a new mill on Mormon Channel at Stockton and moved the machinery from the old mill to the new. Henry Pierce, pioneer capitalist of San Francisco, joined with Mr. Lane and associates in the building of this new mill and it was the beginning of what is now the Crown Willamette Paper Company.

This Stockton mill was started to manufacture paper from tule (known better as "cat-tails"), but the process did not prove a success, although experiments made before building indicated that paper could be profitably made from this grass.

A year or two before closing down, an 86-inch four-drinier machine made by Smith & Winchester Company was installed, then the most up-to-date equipment in the country. This machine was later sold to the Crown Paper Company and shipped to Oregon.

The Stockton mill went out of business late in 1892.

Wm. Pierce Johnson, a nehew of Henry Pierce, started with California Paper Company in about 1884. He was later general manager of that concern, then president of Willamette Pulp and Paper Company and finally president of Crown Willamette Paper Company.

John Lewthwaite

The Stockton mill was built under the direction of Mr. John Lewthwaite, known the country over as "Dean of Pacific Coast paper makers."

At the age of fifteen, John Lewthwaite went to Rock City Falls, N. Y., to learn the paper making business. He was born on the Isle of Man, England, at the town of Douglas, October 19, 1844, a son of a paper making family for many generations. When John was less than ten years of age the family moved to New York state. John worked two years at the Rock City Falls mill and then went to work in Pioneer Mill, West Milton, N. Y., working there one year. In 1862 he enlisted in the 77th New York Volunteer Infantry, serving two years and ten months to the close of the Civil War. He was wounded in the battles of the Wilderness and at Cedar Creek.

Upon his discharge from military service, young Lewthwaite returned to work in the same mills in Rock City Falls, where he first took up the trade of paper making, remaining one more year. Afterwards he worked for two years in a paper mill in Greenwich, Washington County, N. Y., until he set out for California in 1867, going by way of Panama.

On the Pacific Coast he worked at his trade with S. P. Taylor & Co. in Marin County until 1872, when he made a visit of two or three months to Saratoga County, N. Y. Returning to California, he went to Stockton and went to work in 1873 in Lane's Mill just then converted into a paper mill from a flour mill. When the new works were erected on Mormon Channel by the California Paper Company, he was appointed superintendent and held that position until the mill closed down in 1892.

In 1893 Mr. Lewthwaite went to Oregon City, Ore., to become paper mill sperintendent of Willamette Pulp and Paper Company with mills on the west bank of the Willamette River, at what is now known as West Linn, Ore.

March 16, 1874, John Lewthwaite married a daughter of a paper making family, Alice C. Moore, whose father, W. U. Moore, ran a paper mill at Catskill, N. Y., which was known as the Kaaterskill Mill.

John Lewthwaite remained with the successors of Willamette Pulp and Paper Company until his death December 11, 1924.

One of John Lewthwaite's chief assistants at Stockton, and later at the Willamette mills, was Thomas Warner. Tom, as he is better known among paper mill men, is now 80 years of age and spent 52 years in the employ of Crown Willamette Paper Company and its predecessors in interest, Willamette Pulp and Paper Company and California Paper Company.

Mr. Warner now lives in Oregon City with the good wife he married in Middletown, Ohio, January 9, 1876. On the first day of August, 1879, Tom went to work for California Paper Company and he remained with John Lewthwaite until the mill shut down, moving with him to Oregon City.

Somewhere along about 1910, Mr. Warner invented what is now known as The Warner Equalizer and it has been in use in many of the Pacific Coast mills ever since, being a stock regulator seemingly better fitted to Western conditions than many others on the market. It was developed at the time Willamette mills changed from beaters to tank system on newsprint.

Paper from Cactus at Lick Mills

Lick Paper Company started to make paper at Agnews, California, in 1877. Originally this property was built by James Lick of San Francisco, as a flour mill, but it was down for a number of years, having been built in 1852. It was turned into a paper mill to make paper from cactus, but was not a success with that kind of pulp. Later, A. D. Remington of Watertown, N. Y. purchased the property and made print and wrappings for quite a few years. It was burned and rebuilt in 1882.

J. W. Barbur who ran a mill at Middletown, Ohio, got an offer from A. D. Remington to take charge at Lick Mills and for the next six months he tried to get Thomas Warner to join him, which he finally succeeded in doing and on October 3, 1878, Mr. Warner entered the employ of the Lick Mills. He did not stay very long at this plant because he saw better opportunities at Stockton mill with John Lewthwaite.

The O'Neill Brothers

The Eagle Mill was built at Punta Arenas (Point Arena), Mendocino County, Cal., about 150 miles north from San Francisco, and in 1880 was in charge of Edward O'Neill, later of O'Neill Brothers and Callaghan Company, Soquel, Cal., and Lebanon, Ore. When the straw ran out and the mill could no longer continue to compete, this mill went out of business, being considered too far away from the best markets of the state. Later the machinery was moved to Corralitos Mill at or near Watsonville, Cal.

The Soquel Mill, also known as South Coast mill, was built at Soquel, Santa Cruz County, Cal. in 1880-1881 and made its first paper in February, 1881, by Edward and Frank O'Neill, who later with C. W. Callaghan of San Francisco built a mill at Lebanon, Ore., now a part of Crown-Willamette Paper Company.

In *Superior Facts*, September, 1928, there appeared a letter from Frank O'Neill to an old friend in Massachusetts. We quote from that letter:

"I came to San Francisco and went to work building

windmill frames and putting them up. I went from that into A. D. Remington's paper store. There was a paper mill in Stockton, Cal. and they offered me more of a salary and I went up there. My brother Ed. had charge of a small paper mill about 150 miles north of San Francisco and after running out all the straw they had, he came down to San Francisco where he got a position running a machine preparing the paper for a new printing press.

"All the time my brother and I were looking for an opportunity to build a small paper mill. I hit on this place (Soquel) and made a dicker with the owners. We leased the property for five years with the privilege of buying. I gave up my position in Stockton mill and went East to have the machinery made. E. P. Tanner of Lee, Mass., built the machinery; that was in 1880. I got the mill started in February, 1881. We made money here. My brother John died here a few years after. Then my brother Ed. and I took in a partner, C. W. Callaghan. We made straw wrapping paper. When we built the mill the principal crop was wheat and we got plenty of wheat straw to make paper out of. Now, you could not get enough to supply a good livery stable. The country is all set out to fruit, berries and vegetable gardens.

"We saw it coming as early as 1889 and my brother secured a location with waterpower in Oregon. I built a fine mill there. I got the mill started in 1892. It was a dandy mill, one of the best in the U. S. making straw paper. We put in another machine and a sulphite plant to make pulp out of wood. We made No. 1 manila and straw wrapping in the mill. My brother Ed. died before we got the sulphite mill running and making manila paper.

"We sold the mill in 1906. I regretted to part with it. It was a fine property. It was in a town in Oregon—Lebanon, Linn County. You may say we built up the town."

It was not long thereafter, this letter being written September 16, 1922, that Frank O'Neill also passed on.

Straw Wrapping Mills

The Corralitos mill was built at or near Watsonville, Cal., by Brown Brothers and Watson in 1881-82. It was really a merger of two older mills, the Eagle Mill at Point Arenas in Mendocino County and what was known as The Caledonia Mill at Saratoga. James Brown was the guiding hand in the manufacture of the paper as well as in the selling of the product.

Later, when the California Paper Company went out of business, the smaller machines of the Stockton mill were sold to Mr. Brown and associates and moved to his operations.

The Paper World, Springfield, Mass., January, 1892, page 20, printed the following:

"The San Francisco papers report that the following straw wrapping mills on the Pacific Coast have agreed to "pool their issues": South Coast paper mill, at Soquel; Enterprise mills, Antioch; Corralitos Mills, Watsonville; Straw Paper Company, Lebanon, Oregon; Crown Paper Company, Oregon City, Oregon; Columbia River Paper Company, La Camas, Washington, and Bridal Veil Paper Mills, Bridal Veil, Oregon."

George B. Walker made pulp near Los Angeles from Yuccadraconis in April, 1883. This plant was not a success and failed in 1884. It was known as Soledad Paper Mills.

Enterprise Mills, Antioch, are now a part of Fibreboard Inc., but little or none of the original equipment will be found there now.

Columbia River Paper Mills at Camas, Wash., made the first groundwood in Washington and on the Pacific Coast in April, 1885, and the first paper made from this new pulp ran over the paper machine in that plant on May 5, 1885.

This mill was burned and the machinery for groundwood manufacture was sold. However, a new mill was built and new pulp mill machinery added.

Oregon's First Groundwood Mill

Youngs River Falls Mill was the first groundwood mill in Oregon, though the first groundwood made on the Pacific Coast was made in the Pittock mill at La Camas, Washington. R. M. Brayne started this Youngs River Mill in 1886 with the same pulp grinders that were in the original mill at Camas, Wash., and which was burned, thus the same pulp grinders made the first pulp in both Oregon and Washington. Mr. Brayne at first operated this mill as his own property but it cost more to build and operate than he had expected and he later took in as partners, Henry Pierce of San Francisco, and others of the Willamette Pulp & Paper Company and California Paper Company.

The pulp made at this plant was shipped to California Paper Company, Stockton, Cal. as long as that plant operated and then for some years was shipped to West Oregon City (now West Linn) mill at the Willamette Falls.

Oregon's first groundwood mill built at Young's River Falls, near Astoria, was designed and built by R. M. Brayne who was from a family of paper makers. His father operated paper mills in England for the British Crown under Sir Robert Peel, who was Prime Minister during Queen Victoria's reign. He later crossed the seas to Canada to locate in Ontario with Colonel Talbot who was sent to Canada to encourage the settlement of this far Western possession.

R. M. Brayne was born at Port Stanley, Ont., in 1837. His father died when the son was but a child. When young Brayne reached his majority he took up saw mill work and in 1860 married Hannah Shanks at Chatham, Ont.

After a few years in Deshler, Ohio, cutting sycamore lumber from lands owned by the Deshler family, who were interested in Beckett Paper Mills, Hamilton, Ohio, followed by two years in Reed City, Mich., he moved his family to the Pacific Coast, intending to locate at Florence, Ore. However, for reasons of his own, instead of going into the saw mill business at Florence, he decided to produce groundwood pulp and located at Young's River Falls in 1885, locating on a site owned by Hans Oliverson and leasing the power from D. P. Thompson of Portland, who had taken up the power at this point.

The first groundwood mill in Oregon was built on this site with a Pelton water wheel and an 87-foot head supplied by a 30-inch pipe from the dam. There were four grinders of five pockets, each built by Bagley & Sewall Company of Watertown, N. Y., but purchased by Mr. Brayne from the owners of the burned mill at La Camas, Washington Territory.

Mr. Brayne operated the property himself for a year or two but The Falls Pulp Company was incorporated under the laws of the state of Oregon, October 19, 1887, with S. R. Fairchild, president and J. H. Spadone, secretary, both of San Francisco.

Duncan M. Shanks, a nephew, entered the employ of the company November 19, 1888 and remained with the mill until it went out of business in 1904, when the machinery that was still usable was shipped to Oregon City to the plant of Willamette Pulp & Paper Company and one of the wet machines is still in use there.

During a part of the time Mr. Brayne operated the plant at Young's River Falls, the only mail received came by Wells Fargo & Co. Express to Astoria and it was necessary to row a boat eight of the ten miles from the Falls

to Astoria and then hike over the hills from Young's Bay to the Express office in the town.

This mill made between 40 and 50 tons per week wet weight, and about 40 per cent dry as Mr. Shanks' reports show. The pulp was shipped by sail scow owned by Captain Oliverson to Astoria where it was loaded on ocean boats for San Francisco and then transhipped by river boat for delivery at Stockton, Cal.

Mr. Brayne had but one child, now Mrs. Duncan M. Shanks of West Linn, Ore., and Mr. Shanks is still with Crown-Willamette Paper Company, the successor of Falls Pulp Company through Willamette Pulp & Paper Co.

Mr. Brayne died at his daughter's home in West Linn, Oregon, at an advanced age only a few years ago.

The Towle Pulp Mill operated by Towles Brothers Lumber Mill at Alta in the Sierra Nevada mountains in California, started the manufacture of groundwood pulp on the line of the old Central Pacific R. R. in 1886. The quality of the pulp was not good and this property did not continue in the manufacture of wood pulp for paper very long, although it is said to have made dry groundwood very successfully for powder manufacture.

Willamette Pulp and Paper Co.

Willamette Pulp and Paper Company of California started at West Oregon City late in 1889 to manufacture groundwood pulp for shipment to Stockton, Cal., for the California Paper Company mill there. It was owned by some of the same people as the California mill, with Henry Pierce, San Francisco capitalist, as banker.

Later, the first sulphite mill to be built on the Pacific Coast was added in 1891, and then the paper machines were added, the first paper being made late in 1891. This plant is now a part of Crown-Willamette Paper Company.

Garret M. Schenck, later president of Great Northern Paper Mills, Millinocket, Maine, assisted Wm. Pierce Johnson in the designing and building of the first plant for Willamette Pulp & Paper Company at West Oregon City (now West Linn). Mr. Schenck and Mr. Johnson were school boys together in New England.

The Pierce Family

Henry Pierce was born in Freiberg, Maine, about 1825. With his brothers William and Lewis he came to the Pacific Coast and arrived in San Francisco among the first, at the time of the gold rush. He went into the wheat and shipping business and prospered. His business was handled as H. & W. Pierce, even though he operated alone the last half of his life. He had two other brothers, Marshall and Ira, and one sister, the mother of Wm. Pierce Johnson.

Along about 1885, his two nephews, Orestes Pierce and Wm. Pierce Johnson, the former a son of Marshall Pierce, joined Henry Pierce on the Pacific Coast and entered the paper business. Both were college men, graduates of Harvard.

Henry Pierce financed the beginning of the pulp and paper industry, the rubber industry and many other interests on the Pacific Coast, as well as being interested in banking and owning large cattle ranches in Southern California. He was also a man of very expensive hobbies, the breeding and racing of trotting horses and the breeding and showing of Jersey cattle. Lou Dillon, the fastest trotting mare ever on the mile track was foaled on Henry Pierce's Santa Rosa Stock Farm in Santa Rosa, Cal., and many of the highest scoring Jerseys of his time were the product of his Yerba Buena Ranch at Evergreen, Santa Clara County.

Henry Pierce lived and died a bachelor, leaving this world on January 13, 1903, and his nephew Orestes Pierce followed him exactly ten months thereafter, November 13, 1903. Mr. Johnson died only a few years ago.

Wm. H. Mead was Henry Pierce's secretary for over 50 years and their headquarters were at 728 Montgomery Street, San Francisco.

Henry Pierce had as associates in his paper and pulp enterprises Governor Roswell P. Flower of New York, and members of his family, Mrs. Emma F. Schley, Bertrand L. Taylor and John L. Taylor of Watertown, N. Y. Edward Woodman of Portland, Maine was Eastern attorney and B. L. Taylor acted as Eastern director for many years.

When Henry Pierce died, his estate was incorporated as provided in his will, and H. & W. Pierce Inc. was the largest stockholder in many industries. Wm. Pierce Johnson was president of H. & W. Pierce Inc., after the first president Orestes Pierce died, and B. T. McBain was secretary until he was transferred from San Francisco to the paper mills in Oregon at the time of the San Francisco fire, April 18, 1906.

Wm. Pierce Johnson was one of the best informed pulp and paper manufacturers of his time. He started in the paper business when he left college about 1884-5 as a part of California Paper Company at Stockton, Cal. His uncle, Henry Pierce, was the largest owner of this property and, being without chick or child, he started his nephews Orestes Pierce and Wm. Pierce Johnson in the way of taking over his affairs. Mr. Johnson learned the business from the ground up and his manufacturing instructor was always Uncle John Lewthwaite, who was also a part of the Pacific Coast paper business all of his business life.

It was not long before Mr. Johnson took the bit in his teeth and almost full charge of the business. His cousin Orestes Pierce was president of Willamette Pulp & Paper Co., their Oregon interest, but Mr. Johnson was vice-president and general manager, full of vigor, vim and vitality and always interested in keeping his properties ahead of the game if possible.

Orestes Pierce died in November, 1903, ten months after his uncle Henry Pierce passed away and this left the full load of the business on the shoulders of Mr. Johnson.

In October, 1914, the properties of Willamette Pulp & Paper Co. and the Crown Columbia Paper Company were consolidated and the new concern was named Crown-Willamette Paper Company. Mr. Johnson was its president and Louis Bloch vice-president. A few years thereafter Mr. Johnson let down on work a little, became chairman of the board and Louis Bloch took up the presidency, which he has held these many years.

Mr. Johnson died while on a trip in Europe a few years ago at the age of about 70 years.

Crown Paper Co.

Crown Paper Company was built at West Oregon City, Oregon, now West Linn, in 1890 and the first paper made at Willamette Falls was made in this mill although wood pulp was manufactured on the West Bank of the Willamette River by Willamette Pulp & Paper Company before Crown Paper Company started operation.

This mill was built by Ludwig and Sigmund Schwabacher, men of the same family name but no relation to each other. They had as a partner S. D. Rosenbaum of New York.

Later, Wm. P. Hawley, Sr. joined this company and rebuilt the plant, adding sulphite and groundwood, and starting it on the way to prosperity.

Ludwig and Sigmund Schwabacher came to America when very young men. They were not related and did not know each other until after they arrived in New York.

Along in the early 1880's they travelled west to the Pacific Coast and with an associate S. D. Rosenbaum of New York, they entered the pulp and paper manufacturing business.

While Henry Pierce and associates had already started their first groundwood pulp mill at West Linn, and had acquired first rights at the Willamette Falls after the Willamette Transportation and Locks Company and Portland General Electric Company, Messrs. Schwabacher took up property farther down the locks and built the first paper mill on that side of the river, producing straw wrapping paper and using the fir wood of that section for fuel only.

Their first paper was turned out in 1890 but the plant was not entirely a success until after Wm. P. Hawley, Sr. became mill manager and superintendent a few years thereafter. Then sulphite and groundwood pulp mills were added and prosperity came with these additions.

Louis Bloch, now president of Crown-Willamette Paper Company and holding that position for the past many years, started in the paper business with Crown Paper Company at 707 Front Street, San Francisco, along about 1895. He was a big factor from the time he first took charge of that concern's operations, and had much to do with all the consolidations that followed: when Crown Paper Company first consolidated with Columbia River Paper Company, then owned by Henry L. Pittock and Fred W. Leadbetter; again when Crown Columbia Pulp & Paper Company added Floriston Pulp & Paper Company, and then again when Crown Columbia Paper Co. and Willamette Pulp & Paper Company consolidated in 1914 and later, consolidating with the Zellerbach interests, forming Crown Zellerbach Paper Company.

While Willamette Pulp & Paper Company depended largely on the advice of John Lewthwaite, regarding things mechanical, Crown Columbia Paper Company looked to Alex. J. Lewthwaite, a nephew of John.

For a number of years Wm. P. Hawley, Sr. was in charge of the plants of Crown Paper Company and Columbia River Paper Company, as well as Floriston Pulp & Paper Company, but about the time A. J. Lewthwaite entered the picture in 1907-8, Mr. Hawley retired and started the new industry, Hawley Pulp & Paper Company in Oregon City, Oregon.

Louis Bloch is still a young man, and while he has delegated a large part of the work to others, including George P. Berkey, vice-president, who operates all Crown-Willamette Paper mills as well as their interests in British Columbia, he will probably remain at the helm for many years to come.

Their offices are in Crown-Zellerbach Building, San Francisco.

Mortimer and Herbert Fleishhacker

This short history would not be complete without bringing these two bankers and the concern H. Fleishhacker & Sons into the picture. Like A. Zellerbach & Sons in the paper sales business, the concern H. Fleishhacker & Sons in the paper board and paper box business was one of the pioneers in the sales end of the strawboard manufacturing industry, converters.

As bankers and as large stockholders in Crown Columbia Paper Company they had a large part in the consolidations which took place from and after 1900, and their close association with the pulp and paper industry during the past forty years have given the industry considerably more standing in the financial world than otherwise might have been possible.

When the Crown Paper Company and Columbia River Paper Company consolidated, and again when Columbia River Paper Company, the second consolidated with Crown Columbia Paper Company; also, when Crown Columbia Paper Company and Willamette Pulp & Paper Company joined hands, Fred W. Leadbetter was a factor.

Fred W. Leadbetter

Fred W. Leadbetter is a son-in-law of the late Henry L. Pittock, the first newspaper editor-publisher-paper manufacturer of the Pacific Coast. Along in the 1890's when business was almost at a standstill, Mr. Leadbetter elected to become a paper mill man and became lessee of Columbia River Paper Mills at Camas, Wash., operating the property as F. W. Leadbetter, Lessor. During the period he was at Camas, he added a sulphite mill and with his persistent, "go-getting" personality, always on the job, it was not long before his presence was felt in the industry. His success really brought about the consolidation of his concern with Crown Paper Company, but it was not long after the consolidation that Mr. Leadbetter decided he could do better alone. He started a new concern to be known as Columbia River Paper Company with the intention of manufacturing paper in Vancouver, Wash., in connection with the Pittock-Leadbetter Lumber Mills at that city. This was in 1907-8 and A. J. Lewthwaite was associated with Mr. Leadbetter in this new enterprise. After ordering a 152-inch fourdrinier paper making machine from Bagley & Sewall Co., Watertown, N. Y., another consolidation was affected by Crown Columbia Pulp & Paper Company with this new or second Columbia River Paper Company, forming Crown Columbia Paper Company and the new machine was erected at Camas, Wash., instead of at Vancouver.

After a few years, Mr. Leadbetter again left the fold and started other paper plants, including Oregon Pulp & Paper Company at Salem, Ore., California Oregon Paper Mills at Los Angeles, Cal., and the third Columbia River Paper Mills at Vancouver, Wash., all of which he now operates through his offices in Oregonian Building in Portland, Oregon.

Alexander J. Lewthwaite

Alexander J. Lewthwaite was born on the farm at the Clackamas River Paper Mill owned and operated by Henry L. Pittock and of which mill William Lewthwaite was manager and superintendent. A. J. was born in 1869 and moved with the family to Camas, Wash., when the plant was transferred to Washington Territory. Later A. J. entered the employ of California Paper Company at Stockton, Cal., which was under the management of his uncle, John Lewthwaite. Later he was transferred to Oregon to the new paper mill on the west side of the Willamette River opposite Oregon City and was there for about ten years until he was holding the position of paper mill superintendent under his Uncle John who had previously been put in charge after the closing of the Stockton paper mill in 1893.

Early in the present century, A. J. left the Pacific Coast and became associated with different Eastern paper mill concerns, Kimberly-Clarke Company at Niagara, Wis., A. D. Remington Company and others around Watertown in northern New York.

In 1907-8 A. J. Lewthwaite returned to the Pacific Coast to be associated with F. W. Leadbetter in a new undertaking at Vancouver, Wash., to be known as Columbia River Paper Company, but before the plant was built Mr. Leadbetter again consolidated his enterprise with Crown Columbia Pulp & Paper Company, and both Leadbetter and Lewthwaite became officers of the latter con-

cern, Leadbetter for the second or third time, with Lewthwaite in charge of all manufacturing.

In 1914 Crown Columbia Paper Company and Willamette Pulp & Paper Company consolidated their interests in Crown-Willamette Paper Company. Lewthwaite was in charge of manufacturing of Crown Columbia and B. T. McBain was resident manager in charge of operation for Willamette Company. For the balance of the year 1914, after the consolidation, A. J. Lewthwaite and B. T. McBain handled all manufacturing matters for Crown-Willamette Paper Company, but realizing that authority must be placed with responsibility, they flipped a coin the first of 1915 and Lewthwaite became general manager and B. T. McBain, operating manager of all the Oregon and Washington operations of this company, which were later extended to Ocean Falls, B. C. in 1917 when the building of that property was started.

Mr. Lewthwaite died only a year or two ago while still a resident of Portland, Ore., but he had retired as an active official of Crown-Willamette Paper Company sometime before his death due to poor health. He was a very active man and, like his Uncle John Lewthwaite, had much to do with the building up of the pulp and paper industry of the great Pacific Northwest.

The First Sulphite Mill

The first sulphite pulp made on the Pacific Coast was made by Willamette Pulp & Paper Company at West Oregon City (now West Linn) under the direction of James P. Lovett. In 1891 bronze digesters were installed and the first pulp was shipped to California Paper Company in Stockton, Cal., where the first all groundwood and sulphite paper entirely made from Pacific Coast woods was made by John Lewthwaite and Tom Warner. Later steel shell, cement lined digesters were installed in place of the bronze ones, the latter being impracticable in many ways.

James P. Lovett later became general superintendent of the West Linn mills of the Crown-Willamette Paper Company and held that position for many years. He started in the industry at Watertown, N. Y., his native state, and came West to help build Willamette Pulp & Paper Company's plant.

Mr. Lovett died at West Linn, Oregon, July 20, 1934. He had served the pulp and paper industry of the Pacific Coast for over 50 years.

Franklin T. Griffith

While Mr. Griffith is now president of Portland Electric Power Company, Portland General Electric Company and many other public service concerns, he was a factor as an attorney and before taking up the law, as a part of the pulp and paper industry. Mr. Griffith started with the old California Paper Company and then was sent to Oregon to be in the office of Willamette Pulp & Paper Company about the time that concern started business on the west side of the Willamette River opposite Oregon City.

In 1892 he opened offices for the practice of law in Oregon City and, before becoming president of the public service concerns mentioned, was general attorney for Willamette Pulp & Paper Company, Crown Columbia Paper Co., Hawley Pulp & Paper Company and many of their associated corporations, and his firm, Griffith, Peck & Coke now act as attorneys for all of the above and Columbia River Paper Mills, Oregon Pulp & Paper Company, St. Helens Pulp & Paper Company, Powell River Co., Ltd., and others. Mr. Griffith is not now active in the law business but keeps his finger on the pulse of the pulp and paper industry the same as of old.

Everett Pulp and Paper Co.

Organized in 1891 as the Puget Sound Pulp & Paper Co., which company was organized by Eastern capitalists as part of the plan for the development of the townsite of Everett, Wash.

Erection started in 1891, completed and first paper made in July, 1892. At the time the president was Henry Hewett, Jr., the superintendent and manager, W. S. Barnes and the assistant treasurer, William Howarth. Subsequently Garner Colby became president and L. B. Stewart, general manager.

On February 1, 1896, Gardner Colby was president and William Howarth, manager. A. H. B. Jordan was superintendent.

John D. Rockefeller acquired controlling interest in 1898, when F. T. Gates (Mr. Rockefeller's private secretary) became president and William Howarth, manager and treasurer.

In January, 1902, William Howarth, Leonard Howarth (brother of William) and A. H. B. Jordan (then superintendent) purchased Mr. Rockefeller's interest and all other interests in the company. William Howarth was elected president and treasurer; A. H. B. Jordan, vice-president and superintendent, who to-day (August, 1934) still retain the same executive positions.

In May, 1930, Leonard Howarth died, and his interest passed to the daughters of William Howarth, so to-day the ownership is still held by William Howarth, his family, and A. H. B. Jordan.

W. J. Pilz, son-in-law of William Howarth, is now manager of the company.

The paper originally made in 1892 was, book, manila, express, wrapping, cover and commercial writings; and which to-day are still being produced with the exception of wrapping papers, but with the addition of label papers.

This company now has the most up-to-date fine paper mill of three machines and auxilliary soda pulp mill on the Pacific Coast.

Lebanon Paper Co.

This company was started as Straw Paper Company in 1892 and was built by Edward and Frank O'Neill and C. W. Callaghan. This plant started making a straw wrapping on a 72-inch cylinder machine. Later a small sulphite mill was added with a Soloman Bruenger digester made by Pusey & Jones Co., Wilimngton, Del., and a second paper machine, a 72-inch fourdrinier. This digester was still in the mill and in use when taken over May 25, 1906, by Lebanon Paper Company, a California corporation, owned then by some of the same people as Willamette Pulp & Paper Company. Norman R. Lang was the first general manager and B. T. McBain was his assistant at the plant, 1906 to 1910.

Other sulphite digesters have been added since and the plant now is the property of Crown Willamette Paper Company. A third paper machine was installed a year or two ago.

Bridal Veil Paper Mills

These mills were built at Bridal Veil, Ore., in the early 1890's for the manufacture of straw papers. L. G. Gurnett who had been superintendent at Willamette Pulp & Paper Company mill, West Oregon City, was manager. Later W. P. Hawley, Sr., was interested and it finally became the property of Columbia River Paper Company at Camas, Wash.

Floriston Pulp & Paper Co.

Floriston Pulp & Paper Company was built at Floriston, Cal., near the Nevada line and about 20 miles from Reno, Nevada. This plant was designed and built by W.

P. Hawley, Sr., for the same people as Crown Paper Company of West Oregon City. This plant was built about the year 1900. The property is now idle; is a part of Crown-Willamette Paper Company. There were three paper making machines, but one has been moved.

Trouble with the City of Reno over their water supply, taken from the same river as the paper mill, caused litigation over many years and finally the paper mill closed down.

Hawley Pulp & Paper Co.

The mill at Oregon City, Ore., started to make paper in 1909. W. P. Hawley, Sr., formerly general manager of Crown Columbia Paper Company, built this mill on an old flour mill property, formerly Portland Flouring Mills Company, and with the aid of the water power owned by that concern, and leased power from Portland General Electric Company at Willamette Falls, this mill was started manufacturing wrapping papers from sulphite and groundwood, as direct competitors of Crown Columbia Paper Company.

After a very bitter price cutting war, a truce was declared and peace reigned thereafter for many years until the third Columbia River Paper Mills were built and the product put on the market by Fred. W. Leadbetter.

Mr. Hawley's associates were Messrs. Ladd and Wilcox, Portland bankers, and a few other financially able people of Oregon and Wisconsin.

The following is part of an article in "Superior Facts" March, 1932, number:

Willard Prescott Hawley gave more than 56 years of his life to the art of paper making. Born at Malone, N. Y., February 28, 1856, Mr. Hawley entered the field of paper making in his early boyhood and long before his death December 1, 1931, he had worked his way up among the leading paper manufacturers of the United States.

He started in the paper mill of Clark Weed in Malone when 16 years of age. One and one-half tons per ton was this mill's capacity. He worked up fast in this mill, but had to leave when he was 21 years of age because of illness and on March 31, 1877, he went to Stockton, Cal. He secured a position as machine tender in the paper mill there. Here also he met and married Eva Adela Pusey whose father and two or three generations before him had been paper makers in England.

Mr. Hawley had many inventions and patents and returned East to exploit them and took up the revamping of old mills. His success was immediate and he was in demand in many districts.

In 1892, Mr. Hawley at the request of S. D. Rosenbaum, president of Crown Paper Company, Oregon City, Ore., went to Oregon City and became superintendent of the mills there. Eighteen years later when he left the employ of this concern, severing his connection to go into business for himself, he is said to have been the second largest stockholder in the company.

In 1909 Mr. Hawley built Hawley Pulp & Paper Company in Oregon City, his first mill having 18 tons capacity per 24 hours. When he sold the plant in July, 1930, the capacity had jumped to 265 tons daily.

Mr. Hawley died December 1, 1931, leaving one son, W. P. Hawley, Jr., his widow and some grandchildren. Mr. Hawley was extremely devoted to his wife and son. He seldom entered any business transaction without consulting Mrs. Hawley and on most of his long journeys she accompanied him.

Willard P. Hawley, Jr., was associated with his father in the paper manufacturing business for 20 years and is considered one of the foremost business men in the state of Oregon, fully competent and capable of managing the large estate left by his father.

First Control and Research Laboratory

The first chemical laboratory in the pulp and paper industry on the Pacific Coast was started at the West Linn Mill of the Willamette Pulp & Paper Company in 1910 with F. A. Olmstead in charge. Up to that time Mr. Olmstead had been with A. D. Little, Inc., chemists of Boston, Mass. Many important discoveries were made in this department, but in 1915 the directors decided to close out this work, with the exception of routine analytical work, and the entire crew was laid off for a period. Later this mistake was rectified and even greater equipment installed with the result that now many times as many chemists are employed.

At the time the laboratory was installed, the plant was in charge of B. T. McBain, then resident manager, who left the company to become director of maufacturing for the Nekoosa Edwards Paper Company in Wisconsin.

Powell River Paper Co. Limited

This company built its first mill in Powell, B. C., in 1910-11. It now operates the largest newsprint mill on the Pacific Coast and one of the largest in the Dominion of Canada. Powell River is about 80 miles north of Vancouver, B. C., reached by steamer only, and now manufactures between 650 and 700 tons daily.

Norman R. Lang was managing director for many years and the controlling interests are the same people as the owners of Brooks-Scanlon Lumber Company, Minneapolis, Minn.

Wm. McBain, a brother of B. T. McBain, was mill manager of this new mill in B. C. and remained with the company for many years in that capacity, leaving to go into business for himself in Vancouver, B. C. about 1922-3.

Many mills have since been built in Oregon, Washington and British Columbia but this record was intended to cover only those mills that might be termed pioneer plants in their respective lines and districts.

Norman Russell Lang

Norman Russell Lang was born about 1868 in San Francisco, Cal., and about 1890 graduated from University of California. Soon thereafter he went to Oregon to learn the paper business and entered the employ of Willamette Pulp & Paper Company, working with L. G. Gurnett, Henry Smith, J. P. Lovett and others. A few years thereafter, Mr. Lang was made mill manager, and later, having acquired an interest in the business, was made resident director. He was a brother-in-law of Orestes Pierce, president of the company, having married Mrs. Pierce's sister.

Mr. Lang grew up with the paper business and in 1910 when Powell River Company, Limited, was started, after the Williamette Pulp and Paper Company interests had joined hands with Brooks-Scanlon Company of Minneapolis to make this Canadian industry a success, Norman Lang was put in charge of this new concern's business with headquarters at Vancouver, B. C., to which city he moved his family not long thereafter.

Mr. Lang saw that plant grow, largely due to his untiring efforts, from an 80 ton property to one of 600 tons or more per day, in the short space of 15 to 20 years of time.

He died as a young man, comparatively speaking, being less than sixty years old when he passed away in his office in Standard Bank Building in his adopted home city, Vancouver, B. C.

Pioneer Salesmen

A number of people not named in this short history should received mention, because of the part they took directly or indirectly in the upbuilding of the pulp and paper industry on the Pacific Coast.

Away back in the early 1890's J. P. Tirrell of the Graham Paper Company went to Australia and New Zealand to build up a market for the then growing paper mills of the Pacific Coast and it was the start made by him that brought many hundreds of thousands of tons of business to Pacific Coast mills in the years to follow.

Then, there were W. C. Richardson and C. A. Richardson, also men connected for years with the Graham Paper Company on the Pacific Coast. Later Clyde Swick, also with the same company handled the business of Hawley Pulp & Paper Company for the first 20 years of that concern's life.

There were the firms of Blake Robins & Co., followed by Blake-Moffitt & Towne, Wm. Ohm of this concern was a pioneer.

Union Bag and Paper Company located in San Francisco with Alexander Lewthwaite, an uncle of A. J. Lewthwaite and a brother of William and John, always in the sales end, such an important adjunct of any business.

James G. Scott, the Bonestells, and Harry R. Williar, the latter handling raw materials in and selling the finished product, developed markets in the Orient for the products of Pacific Coast mills and supplied the sulphite mills of the Coast with sulphur from Sicily and Japan for almost a generation.

There were many others, of course. None of the incidents mentioned in this report happened anywhere near 100 years ago. Truly the Pacific Coast is young.

The Coast is endowed with natural resources to supply a country with paper, for, from the California line through Oregon, Washington, British Columbia and far into Alaska pulpwood in abundance grows, water powers are available near the supplies and shipping, fuel of many kinds are provided, and the climate is second to none.

New High Duty Vacuum Pumps

The Roots-Connersville Blower Corp., Connersville, Ind., has just issued Bulletin 50-B11 devoted to the new high duty Connersville vacuum pumps. Many improvements are claimed by the manufacturer, including accessible roller bearings, improved lubrication, gears and bearings fully protected, herringbone gears, and elimination of stuffing box attention.

Connersville pumps have been used by paper mills for over 25 years, and many of the older pumps are still in service, according to letters in possession of the company. The new pumps covered by Bulletin 50-B11 are built on the modified Cycloidal principle, thus providing increased efficiency.

In addition to the pumps, other items of paper mill equipment are listed, including a combination flat box unit, a barometric leg, black liquor filter pumps, and blowers.

The bulletin contains sectional views of the new pump, as well as illustrations of several installations.

While this new bulletin refers specifically to paper mill service, Connersville vacuum pumps have also found wide application throughout the process industries. A cross section of the pump graphically shows the rotary positive operating principle, of which Roots-Connersville were the pioneers.

Connersville vacuum pumps are now sold direct to the mills by district offices maintained in metropolitan areas.

TAPPI Notes

K. E. Buff formerly of the Institute of Paper Chemistry has joined the Owens Illinois Glass Company, Carlyle, Ill., as chief chemist.

John Van Oumsem recently with Paperboards, Inc., Chicago, is now with Pioneer-Flintkote Company of Los Angeles, Cal.

J. C. Nutter of Bennett, Inc., Chambly Canton, P. Q. is now with Gair Canada, Ltd., Montreal, P. Q.

R. T. Woodford formerly of Zimmer Paper Products, Indianapolis, Ind., is now with Dodge Chemical and Manufacturing Company, Chicago.

W. L. Cunningham of Pacific Mills, Ltd., is now a student at the University of British Columbia.

R. M. Drummond who was for several months at the Palmer, N. Y. mill of the International Paper Company has returned to the Gatineau, P. Q. mill.

Duncan Cameron who was for several years with Cooke & Nuttall, Ltd., is now with Townsend Hook & Co., Inodland, Kent, England, as assistant manager.

G. D. Bearce formerly of the International Paper Company, Dalhousie, N. B. has opened an office as consulting engineer, in Suite 2107, 501 Fifth avenue, New York, N. Y.

W. O. Hisey formerly of P. H. Glatfelter Company is now instructor in pulp and paper at the New York State College of Forestry, Syracuse, N. Y.

P. M. Loddengaard is now with Bulkley, Dunton & Co., New York, N. Y.

H. T. Baker, formerly of Dayton, Ohio, is now engineer with the Clifton Paper Company, Clifton, N. J.

E. P. McGinn, formerly a student at the New York State College of Forestry is now chemist for the Foster Paper Company, Utica, N. Y.

Carl Apelgren formerly chemist for Taggert Bros. Company, Oswego, N. Y. is now chief chemist for the St. Regis Paper Company at Deferiet, N. Y.

H. W. Morgan formerly instructor in pulp and paper at the New York State College of Forestry, Syracuse, N. Y. is now instructor at the Institute of Paper Chemistry, Appleton, Wis.

Schroon River Mill Starts

[FROM OUR REGULAR CORRESPONDENT]

WARRENSBURG, N. Y., Oct. 8, 1934—Operations were started early this week by the reorganized Schroon River Pulp and Paper Company following a shutdown of several years. It was stated that a papermaking machine was in operation and that the plant would be running full blast soon. Three shifts of men have been recalled for work and plans are said to call for day and night schedules. The company has orders booked which will insure steady activities for several months. Adjustments are now being made to the machine in operation as soon as defects appear and it is expected that everything will be running smoothly by the end of the week.

Norwegian Newsprint Shipments Decline

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 8, 1934.—Shipments of newsprint from Norway declined about 18 per cent compared with last year, with prices generally lower, according to a report from Vice Consul Walter C. Dowling, Oslo. Production for the current year is expected to reach 170,000 metric tons, an increase of approximately 10,000 tons over last year. It is reported that several newsprint producers are disposing of their pulp owing to the low prices ruling in the newsprint market.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING OCTOBER 6, 1934

WALL PAPER

R. F. Downing & Co., Soyo Maru, Kobe, 2 cs.; ———, Manhattan, Havre, 9 cs.; S. K. Lonegren, Gripsholm, Gothenburg, 4 cs.; do, Kungsholm, Gothenburg, 1 cs.

NEWSPRINT

Jay Madden Corp., Scanmail, Wiborg, 210 rolls; do, Scanmail, Kotka, 524 rolls; Lunham & Reeve, Inc., by same, 136 rolls; Jay Madden Corp., St. Louis, Hamburg, 129 rolls; Star Co., Markland, Liverpool, N. S., 390 rolls; N. Y. Tribune, by same, 1,483 rolls; World Telegram, by same, 632 rolls; Bridgeport Herald, by same, 41 rolls; Gilman Paper Co., by same, 391 rolls; ———, Manhattan, Hamburg, 318 rolls; Perkins Goodwin & Co., by same, 224 rolls; International Paper Co., Cornerbrook, Dalhousie, 4,587 rolls; Star Co., Christiansborg, Quebec, 3,799 rolls; Perkins Goodwin & Co., Hamburg, Hamburg, 123 rolls.

PRINTING PAPER

E. Dietzgen & Co., Black Eagle Rotterdam, 3 cs.; International F'd'g Co., Pennland Antwerp, 20 cs.; F. C. Strype, Volendam, Rotterdam, 13 cs.; ———, Manhattan Hamburg, 7 cs.; Fuchs & Lang Manfg. Co., Hamburg, Hamburg, 4 cs.; J. H. & G. B. Siebold, Inc., by same, 4 cs.

WRAPPING PAPER

D. E. Bordner, Hamburg, Hamburg, 4 bls.

FILTER MASSE

A. Giese & Son, Berengaria, Southampton, 1 cs.

FILTER COMPOUND

Gerhard & Hey, Volendam, Rotterdam, 25 crates, 10 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Olympic Southampton, 3 cs.; do, American Trader London, 14 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., American Trader, London, 5 cs.

METAL COATED PAPER

K. Pauli Co., St. Louis, Hamburg, 38 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Pennland, Antwerp, 43 cs.; Chas. Happel, Manhattan, Hamburg, 15 cs.; L. A. Consmiller, Europa, Bremen, 7 cs.

TRANSFER PAPER

F. L. Kramer & Co., St. Louis, Hamburg, 29 cs.; D. C. Andrews & Co., Hamburg, Hamburg, 2 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Georgic Liverpool, 17 cs.; (duplex).

DECALCOMANIAS

Sellers Transportation Co., Europa, Bremen, 21 cs.

STENCIL PAPER

Chas. Happel, H. Jaspar, Antwerp, 2 cs.

PARCHMENT PAPER

Vulcan Yeast Co., Hamburg, Hamburg, 1 cs.

MISCELLANEOUS PAPER

Japan Paper Co., Tai Yang, Kobe, 9 cs.; E. Fougera & Co., Paris, Havre, 85 cs.; E. O'Toole, by same, 2 cs.; The Borregaard Co. Inc., Kungsholm, Gothenburg, 650 rolls, 83 bls.; Kraemer & Co., by same, 149 bls.

RAGS, BAGGINGS, ETC.

S. Birkenstein & Son, Nordkap, Barcelona, 159 bls. rags; E. Butterworth & Co. Inc., Artigas, Manchester, 24 bls. newcuttings; Walker Goulard Plehn Co., by same, 40 bls. rags; Royal Manfg. Co., Georgic, Liverpool, 50 bls. cotton waste; ———, Exter, Alexandria, 156 bls. rags; E. J. Keller Co. Inc., Exeter, ———, 99 bls. rags; Continental Bank Trust Co., Exeter, Leghorn, 94 bls. rags; New England Waste Co., Nichiyo Maru, Shanghai, 250 bls. cotton waste; ———, by same, 206 bls. bagging; Banco Coml. Italiane Trust Co., Hamburg, Hamburg, 44 bls. rags.

HIDE GLUE

———, Hamburg, Hamburg, 50 bags.

OLD ROPE

W. Steck & Co., Volendam, Rotterdam, 72 coils; E. J. Keller Co. Inc., American Trader, ———, 88 coils.

CHINA CLAY

Whitaker Clark & Daniels, Georgic, Liverpool, 200 bags; English China Clays Sales Corp., by same, 115 bags.

CASEIN

D. C. Andrews & Co., Hamburg, Hamburg, 50 bags.

WOOD PULP

Lagerloef Trading Co., Scanmail, Helsingofrs, 1,357 bls. sulphite, 227 tons; do, Scanmail Wiborg, 2,865 bls. sulphite, 583 tons; Castle & Overton, Inc., by same, 1,040 bls. woodpulp, 208 tons; Lagerloef Trading Co., Scanmail,

Kotka, 1,825 bls. sulphite, 306 tons; J. Andersen & Co., Gripsholm, Gothenburg, 250 bls. sulphite; M. Sone, Manhattan, Hamburg, 664 bls. woodpulp, 105 tons; Guaranty Trust Co., Vulcania, Trieste, 250 bls. woodpulp; Perkins Goodwin & Co., Kungsholm, Gothenburg, 127 bls. sulphate; Price & Pierce, Ltd., by same, 2,600 bls. sulphite; do, by same, 140 bls. woodpulp; J. Andersen & Co., by same, 125 bls. sulphite; Castle & Overton, Inc., Hamburg, Hamburg, 268 bls. woodpulp, 53 tons.

WOOD PULP BOARDS

Johaneson Wales & Sparre, Inc., Scanmail, Wiborg, 226 rolls, 54 tons; Lagerloef Trading Co., by same, 4 bls.; do, Scanmail, Kotka, 68 rolls, 118 bls.

ALBANY IMPORTS

WEEK ENDING OCTOBER 6, 1934

Bulkley Dunton & Co., Tana, ———, 625 bls. woodpulp.

BOSTON IMPORTS

WEEK ENDING OCTOBER 6, 1934

E. Butterworth & Co., Inc., Artigas, Manchester, 340 bags hide clippings; Leigh Textile Co., by same, 46 bls. cotton waste; ———, by same, 78 bls. cotton waste; ———, Artigas Liverpool, 290 bags hide clippings; ———, Exeter, Alexandria, 115 bls. bagging.

PHILADELPHIA IMPORTS

WEEK ENDING OCTOBER 6, 1934

Jay Madden Corp., Scanmail, Helsingfors, 43 bbls. 1 cs. tissue paper; Lagerloef Trading Co., by same, 460 bls. sulphite, 78 tons; do, Scanmail, Wiborg, 1,728 bls. sulphite, 312 tons; do, by same, 4 bls. wood pulp boards; Castle & Overton, Inc., by same, 1,139 bls. wood pulp, 225 tons; J. W. Hampton, Jr. & Co., Scanmail, Kotka, 68 rolls newsprint; Union Waste Co., Soyo, Maru Kobe, 80 bls. rags; Philadelphia Nat'l. Bank, by same, 150 bls. rags; Gilman Paper Co., Markland Liverpool, N. S., 1,751 rolls newsprint; Bulkley Dunton & Co., Segundo, ———, 125 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING OCTOBER 6, 1934

Bank of Montreal, Cornerbrook, Cornerbrook, 4,495 rolls newsprint; ———, Nichiyo Maru, Yokohama, 487 bls. rags; Bulkley Dunton & Co., Segundo, ———, 1,000 bls. wood pulp.

CHARLESTON IMPORTS

WEEK ENDING OCTOBER 6, 1934

Chase National Bank, Soyo, Maru Kobe, 1,200 bls. bagging; ———, by same, 463 bls. bagging.

Timken Win in Ad. Contest

It is interesting to readers of THE PAPER TRADE JOURNAL who have seen The Timken Roller Bearing Company advertisements in this publication, to note that that company was awarded first place by the judges for the most effectively conceived and executed industrial advertising campaign of the year in the Tool and Equipment Division of The National Industrial Advertisers Association at the annual convention recently held in Cincinnati.

South African Newsprint Imports

WASHINGTON, D. C., October 8, 1934—Approximately 90 per cent of the newsprint imported into South Africa during 1933 originated in the United Kingdom and Canada, according to a recent report from Consul General Irving H. Linnell, Capetown. These countries shared almost equally in the trade, with Canada obtaining a slight advantage. No receipts are recorded of American newsprint. During the same year 13,505 short tons of other printing papers were received, about one-third of which came from the United Kingdom. Other important sources of supply were Norway, the Netherlands, Sweden and Germany. The United States also supplied 46 tons. Kraft and other wrapping papers of American manufacture were of comparatively little important in the trade during 1933, although more of it appeared on the market than during preceding years. Sweden dominated this market, having supplied almost 80 per cent of all kraft paper imports.

Paper and Pulp Industry Submits Code Budget

WASHINGTON, D. C., October 3, 1934.—The Paper Industry Authority for the paper and pulp industry has asked NRA approval of a code administration budget of $262,070 for January 1, 1934, to December 31, 1934.

Itemized expenditures include: $38,389 for salaries, $19,474.44 for office expenses, and $41,418.47 for general expenses already paid up to June 1, 1934, and $35,410 for salaries, $23,100 for office expenses, and $72,525 for general expenses, yet to be expended during the remaining period.

The suggested basis of contribution is 10 cents per thousand dollars of reported net sale value.

Any objections must be submitted to Deputy Administrator David H. Tulley before October 12.

Escanaba Paper Co. Signs Agreement

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., October 8, 1934—Announcement is made by John P. Burke, president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, of the signing of a trade union agreement with the Escanaba Paper Company of Escanaba, Mich. It is understood that the terms agreed upon are in connection with future wage and working conditions. Joseph Slater, who several years ago was manager of the Fort Edward branch of the International Paper Co., is now serving in a similar capacity with the Michigan company. The agreement with theb rotherhood is the first ever signed by the company.

Installs Filtration System

The Foster Paper Company, of Utica, N. Y., has recently placed a contract with Hungerford & Terry, Inc., of Clayton, N. J., for a 1,500,000-gallon-per-day complete water filtration system of the most modern type. The raw water will be taken from the Mohawk River about a half a mile away, will be automatically treated with chemical, coagulated, settled and filtered through washrake type mechanical sand gravity filters. The filtered water will be uniformly crystal clear irrespective of the degree of contamination in the raw river water supply. Work is now well under way and the plant should be in operation in approximately one month.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, October 10, 1934.

During the past week trading in the local paper market was moderately active. Inquiries for the various standard grades of paper for future account are fairly numerous and the outlook is encouraging for the closing months of the year. Prices are generally holding to previously quoted levels.

The newsprint paper market is practically marking time at present. There are many rumors around regarding the quotations on newsprint and the situation is very confused. With the rising cost of materials and increased labor costs it is not unlikely that the price of newsprint may be higher next year.

Some improvement transpired in the fine paper market. The volume of inquiries being received indicates livelier demand in the near future. Tissues are moving into consumption in good volume. The coarse paper market is steady and specialties are in seasonal request. The paper board market is unchanged.

Mechanical Pulp

The ground wood pulp market is fairly steady. Manufacturing operations both in Canada, the United States and abroad are being maintained in sufficient volume to take care of current requirements. Prices of mechanical pulp are holding to schedule and reports of concessions are infrequent.

Chemical Pulp

Conditions in the chemical pulp market are fairly satisfactory. Although demand for domestic and imported grades is rather restricted at present the statistical position of the industry is considered sound. The recent breakdown of the European price agreements has not affected the American market and prices here are steady.

Old Rope and Bagging

Sentiment is improving in the old rope market. Inquiries for both domestic and imported old manila rope are more numerous. Small mixed rope is moving in fairly good volume. Prices are steady. The bagging market is rather quiet. Demand for gunny bagging is less active than of late. Scrap bagging is listless.

Rags

The domestic rag market is only fairly active. Demand for new cotton rags is restricted. The request for No. 1 white shirt cuttings for export account has fallen off slightly. Roofing grades are in good demand for the time of year. The imported rag market is affected by the foreign exchange situation.

Waste Paper

Board mill demand for the lower grades of paper stock is light. Quotations on strictly folded news and No. 1 mixed paper remain unaltered. The better grades of waste paper are holding up well. Hard and soft white shavings and hard white envelope cuttings are moving in good volume. Book stock is firmer.

Twine

The local twine market is picking up slightly and demand for the various grades should be brisk from now until the end of the year, at least. There are a number of inquiries around at the present time, some of which should materialize into good orders. Quotations are inclined to be spotty.

New Diamond Grinding Wheel

At the forthcoming National Metal Congress, The Carborundum Company, Niagara Falls, N. Y., will announce and demonstrate another contribution to industry.

It is the Diamond Wheel—a grinding wheel made from genuine South African diamonds, which judging from the results of exhaustive tests is destined to revolutionize the shaping and conditioning of the hard cemented carbides, trade-named Carboloy, Firthite, Vascoloy-Ramet, Carmet, Widia, etc., so extensively used in turning and boring tools. Present tests also indicate that the new wheel will find wide and varied use in the grinding of other materials and metals difficult to grind quickly and economically.

As far back as 1924, Mr. Frank J. Tone, President of The Carborundum Company, in a chapter on abrasives written for Chemistry in Industry, published by The Chemical Foundation Inc., predicted the industrial use of diamonds as an added useful element in the abrasive art. His prediction has come to pass.

The use of diamonds in a grinding wheel has, of course, been influenced by the constantly increasing hardness of various types of tool steel and alloys, and by the introduction of the cemented carbides. Gradually metal hardness has been approaching the hardness of the manufactured abrasive until now there has arrived the hardest of all manufactured materials in the form of turning tools—the cemented carbides.

A very close study of industrial applications of these new wheels is being made and, in the very near future, it is expected that many new developments and many new uses in the grinding of materials of various natures will be announced.

Limited stocks of these wheels are now available in 6 and 7 inch diameters in the coarse, fine and extra fine grades for peripheral and side grinding. Other sizes will be carried just as soon as further uses and consequent demands for the new wheel are developed.

James Church Given Farewell Party

[FROM OUR REGULAR CORRESPONDENT]

BEAVER FALLS, N. Y., October 8, 1934—James Church, who recently resigned as superintendent of Latex Fiber Industries, was tendered a farewell party last week by former business associates. The affair was arranged by the executive board of the athletic association composed of employes of the mill. Mr. Church has not as yet announced future plans but it is understood that he expects to leave this village.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, October 10, 1934.

BLANC FIXE.—Steadiness prevails in the blanc fixe market. Prices are holding to previously quoted levels. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ cents to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The position of the bleaching powder market is practically unchanged. Demand is moderately active. The contract movement is fairly heavy. Bleaching powder is still quoted at from $1.90 to $2.15 per 100 pounds, in drums, at works.

CASEIN.—The casein market is dull. Domestic standard ground is quoted at 10 cents and finely ground at 11 cents per pound. Argentine standard ground is selling at 13 cents and finely ground at 13¼ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Some improvement transpired in the caustic soda market. Prices are holding to schedule. Solid caustic soda is quoted at from $2.60 to $3.10; while the flake and ground are selling at from $3 to $3.05 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is fairly active. Prices remain steady and unchanged. Imported china clay is quoted at from $13.50 to $21 per ton, ship side; while domestic paper-making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE.—Demand for chlorine is fairly persistent. The contract movement is well up to average. Prices are holding to schedule. Chlorine is quoted at from $2 to $2.25 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is firmer. Paper making G gum rosin is quoted at $4.40 and FF wood rosin at $4.30 per 280 pounds, gross weight, in barrels, at southern points. Seventy per cent rosin size is selling at $2.57 per 100 pounds, in tank cars, at works.

SALT CAKE.—Paper mill demand for salt cake is more active. Prices are steady. Salt cake is quoted at from $12 to $14, and chrome salt cake at from $12 to $12.50 per ton, at works. Imported salt cake is selling at from $12 to $12.50 per ton, at works.

SODA ASH.—The soda ash market is exhibiting strength. Contract shipments are moving regularly. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.10; in bags, $1.40; and in barrels, $1.50.

STARCH.—Conditions in the starch market are fairly satisfactory. Prices are inclined to fluctuate slightly. Special paper-making starch is selling at $3.47 per 100 pounds, in bags; and at $3.74 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Trading in the sulphate of alumina market is becoming livelier. Prices remain unchanged. Commercial grades are quoted at from $1.35 to $1.50; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and nearby car loads the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market was along routine lines. Prices are steady. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
Book, Cased—			
S. & S. C.	5.35	@	5.75
S. & S. C. Litho	5.60	@	6.00
M. F.	5.10	@	5.50
Coated and Enamel	5.90	@	6.55
Coated Litho	5.90	@	6.55
Tissues—Per Ream—			
White No. 1	.82½	@	.85
White No. 2	.67½	@	—
Anti-Tarnish M. G. only	1.00	@	—
Colored	.85	@	—
Kraft	.70	@	—
Manila	.67½	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	4.00	@	4.50
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	4.00
Screenings	2.50	@	3.50
Glassine—			
Bleached	.11	@	—
Unbleached	.09	@	—

(The following Quotations are Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Kraft—			
No. 1 Domestic	4.75	@	5.00
No. 2 Domestic	3.87½	@	—
Southern	3.87½	@	—
Boards—per ton—			
News	40.00	@	45.00
Chip	37.50	@	40.00
Sgl. Mla. Ll. Chip	47.50	@	52.50
Jute Lined Chip	47.50	@	52.00
White Patent Coated	60.00	@	65.00
Binders Boards	67.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	22.00	@	24.00
Dry	23.00	@	24.00

(F.o.b. Mill)

No. 1 Domestic and Canadian	22.00	@	26.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Division 1	2.85	@	—*
Division 2	2.80	@	—*
Division 3	2.75	@	—*
Prime Qualities—			
Class 1. All Prime Easy Bleaching	2.25	@	—*
Other Than Easy Bleaching—			
Class 2. Higher Than Standard	2.20	@	—*
Class 3. Standard	2.15	@	—*
Class 4. Lower than Standard	2.10	@	—

(On Dock, Atlantic Ports)

Kraft No. 1	1.70	@	1.80
Kraft No. 2	1.55	@	1.65

(F.o.b. Pulp Mill)

Kraft Domestic	1.70	@	2.25

(Delivered)

Soda Bleached	2.50	@	—

*Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	5.75	@	6.00
Silesias No. 1	3.75	@	4.00
New Unbleached	6.25	@	6.50
New Soft Blacks	3.00	@	3.25
Blue Overall	3.50	@	3.75
Fancy	2.50	@	2.75
Washables	1.75	@	2.00
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	3.75	@	4.00
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.25	@	1.50
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	1.10	@	1.25
No. 2	.80	@	.85
No. 3	.70	@	.75
No. 4	.65	@	.70
No. 5A	.60	@	.65

Foreign Rags

New Rags

New Dark Cuttings	1.60	@	1.70
New Mixed Cuttings	1.75	@	1.85
New Light Silesias	3.75	@	4.00
Light Flannelettes	3.75	@	4.00
Unbleached Cuttings	6.50	@	6.75
New White Cuttings	6.50	@	6.75
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.75	@	1.85
French Blue Linens	2.30	@	2.40
German Blue Linens	2.15	@	2.25
German Blue Cottons	1.70	@	1.80
Checks and Blues	1.30	@	1.40
Linsey Garments	1.40	@	1.60
Dark Cottons	1.00	@	1.10
Old Shopperies	.95	@	1.00
New Shopperies	.90	@	1.00
French Blues	1.70	@	1.80

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.40	@	1.50
Wool Tares, light	1.20	@	1.30
Wool Tares, heavy	1.20	@	1.30
Bright Bagging	1.15	@	1.25
Manila Rope—			
Foreign	2.35	@	2.45
Domestic	2.25	@	2.50
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	2.00	@	2.25
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.70	@	2.80
Ordinary Hard White No. 1	2.15	@	2.25
Hard White No. 2	1.95	@	2.05
Soft White No. 1	1.85	@	1.95
Flat Stock—			
Stitchless	.80	@	.90
Over issue Mag.	.80	@	.90
Solid Flat Book	.65	@	.75
Crumpled No. 1	.60	@	.65
Solid Book Ledger	1.50	@	1.65
Ledger Stock	1.00	@	1.10
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.70	@	1.80
New Cuttings	1.35	@	1.45
Print	Nominal		
Bogus Wrapper	.40	@	.50
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.10	@	1.20
News—			
No. 1 White News	1.15	@	1.25
Strictly Overissue	.65	@	.70
Strictly Folded	.42½	@	.50
No. 1 Mixed Paper	.32½	@	.40

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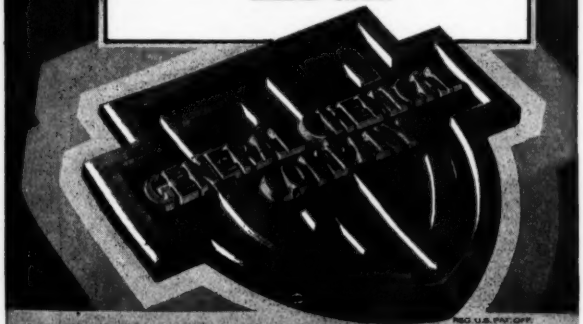

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SVANÖ AKTIEBOLAG
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Twines

(F. o. b. Mill)

Cotton—			
S. C. 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.15	@	.16
Tube Rope—			
4-ply and larger	.09¼	@	.09¾
Fine Tube Rope—			
4-ply	.11¼	@	.11¾
3-ply	.14¼	@	.14¾
2-ply	.14¼	@	.14¾
Paper Makers Twine	.08¼	@	.13¼
Box Twine, 2-3 ply	.14¼	@	.14¾
White Hemp	.13¼	@	.16¼
Java Sisal—			
No. 1 Basis	.11½	@	—
No. 2 Basis	.10½	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.13½	@	.15½
No. 2	.11½	@	.13½
Manila Twine	.24½	@	.29½

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.50
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.11
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¾
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	41.00	@	—
Sheets, open	46.00	@	51.00
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70	@	.80
Solid Books	.60	@	.70
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.50	@	.55
Overissue News	.60	@	.70
Old Newspapers—			
No. 1	.50	@	.55
Mixed Papers—			
No. 1	.30	@	.35
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(Delivered Philadelphia)

Bonds	.05-9/10	@	.38
Ledgers	.06 9/10	@	.40
Writings—			
Fine No. 3	.05	@	.06
Superfine	.10	@	.18
Extra Fine	.15	@	.20
Fine	.15	@	.24
Fine, No. 2	.10	@	.25
Book, M. F.	.05¼	@	.06¾
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06½	@	.09
Coated Lithograph	.06¾	@	.08½
Label	.07	@	.11
No. 1 Jute Manila	6.25	@	—
Manila Sul., No. 1	5.25	@	—
Manila No. 2	3.00	@	—
No. 1 Kraft	5.00	@	—
Southern Kraft	4.75	@	—
Common Bogus	.03	@	.04½
News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	50.00	@	—
Chip Board	45.00	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03½	@	.04
New White, No. 2	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.25	@	1.30
No. 1 Mixed	—	@	.75
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.10	@	1.20
No. 1 Books, heavy	.65	@	.70
No. 1 New Manila	1.35	@	1.40
Print Manila	.50	@	.60
Container Manila	.45	@	.50
Old Kraft	1.15	@	1.20
No. 1 Mixed Paper	.32½	@	—
Straw Board Chip	.30	@	—
Binders Board Chip	.30	@	—
Corrugated Board	.50	@	—
Overissue News	.60	@	—
Old Newspapers	.42½	@	—

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.07¼	@	.11
Rag Content	.12	@	.40
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¼	@	.06½
Manila, Sul. No. 2	.03¼	@	.04½
No. 1 Kraft	.04¼	@	.05
No. 2 Kraft	.03½	@	.04½

(F. o. b. Boston)

Southern Kraft	.03¾	@	.04½

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¼

(Delivered New England points)

News Print, rolls	44.50	@	—
Straw Board, rolls	.009	—	@35.00
Straw Board in Sheets, basis 35s to 70s	—	@40.00	
Filled News Board	40.00	@45.00	
Chip Board	37.50	@40.00	
Chip Board (Creasing)	37.50	@40.00	
Single Manila Lined Chip	47.50	@52.50	
Single White, Patent Coated News Board (Bender)	57.50	@65.00	
Wood Pulp Board	70.00	@75.00	
Binder Boards (Standard Grade)	67.00	@75.00	

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.20	@	2.35
No. 1 Soft White	1.75	@	2.00
No. 2 Mixed	.80	@	.85
Solid Ledger Books	1.75	@	—
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.95	@	1.05
No. 1 Books, heavy	.85	@	.90
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.65	@	.70
White Blank News	1.10	@	1.15
No. 1 Kraft	1.05	@	1.10
Manila	.55	@	.60
No. 1 Mixed Papers	.32½	@	—
Print Manila	.45	@	.50
Overissue News	.50	@	.55
Old Newspapers	.42½	@	.45
Box Board Chips	..	@	.25
Corrugated Boxes	.32½	@	.40
Screening Wrappers	.50	@	.60

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	—	@	1.75
Domestic	1.90	@	2.00
Transmission Rope	.90	@	1.00
Mixed Strings	.40	@	—
Jute Rope	1.35	@	1.40
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.25	@	—
Bleachery Burlap	4.00	@	4.50
Scrap Burlap	1.05	@	1.10
Scrap Sisal	1.10	@	1.20
Scrap Sisal for Shredding	1.20	@	1.25
Wool Tares, heavy	1.25	@	1.30
New Burlap Cuttings	1.45	@	1.50
Australian Wool Pouches	2.00	@	2.25
Heavy Baling Bagging	1.40	@	1.50
Paper Mill Bagging	.90	@	1.10
Bagging No. 2	.50	@	.55

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1.	.05½	@	.06
New White No. 2.	.03½	@	.04
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.05½	@	.06
Blue Cheviot	—	@	4.65
Fancy	—	@	.02½
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, sott	.04	@	04½
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.02¾	@	.03
Corduroy	.01¾	@	.02
New Canvas	—	@	05
B.V.D. Cuttings	—	@	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	04½	@	
White No. 1—			
Repacked	—	@	3.00
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	2.00	@	2.75
Miscellaneous	2.00	@	2.25
Twos and Blues	1.25	@	1.50
Thirds and Blues			
Repacked	2.00	@	2.75
Miscellaneous	2.00	@	2.25
Black Stockings	2.25	@	2.50
Roofing Stock			
No. 1	.70	@	.75
No. 2	.65	@	.70
No. 3	.55	@	.60

Foreign Rags

(F. o. b. Boston)

Dark Cottons	.85	@	.95
New White Shirt Cuttings	5.50	@	6.00
Dutch Blues	2.00	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.55	@	1.60
Old Linsey Garments	1.25	@	1.35

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¼	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.10¼	@	—
No. 2 Colored	.09	@	.10
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	@	—
No. C. (carloads)	6.20	@	—
No. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.22½	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	39.50	@	—
Sheets	44.50	@	—

Pulp

(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	50.00	@	55.00
Sulphate	50.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.30
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.50
Printed Manilas	.70	@	.60
Kraft	1.25	@	1.50
News and Scrap—			
Strictly Overissue	.80	@	—
Strictly Folded	.60	@	—
No. 1 Mixed Paper	.50	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06	@	.06¼
Fancy Shirt Cuttings	.02¼	@	.02½

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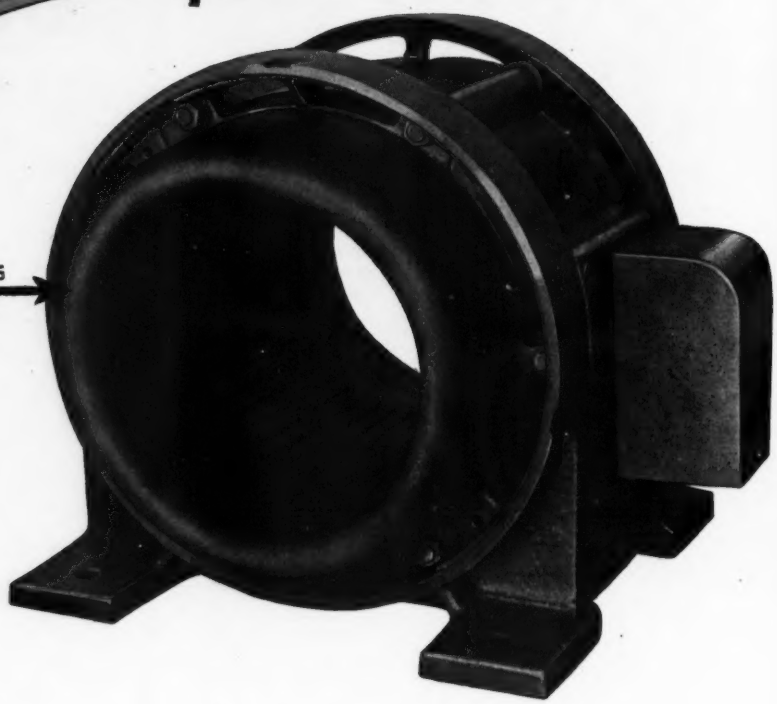
Seal-Clad Motors



CONSTRUCTION FEATURES

Frame—cast steel with feet cast integral.

Stator Core—twistless, distortionless, and self supporting.

Stator Windings—Seal Clad; mechanically protected from dust and moisture.

Rotor—indestructible; bars silver brazed to end rings.

Ball Bearings—mounted in dust tight cartridges.

Sleeve Bearings—sealed enclosure prevents entrance of dust and dirt and escape of lubricant.

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ALLIS-CHALMERS now offers standard open type motors with windings permanently protected against dust, moisture, or similar elements that tend to shorten the life of motor winding.

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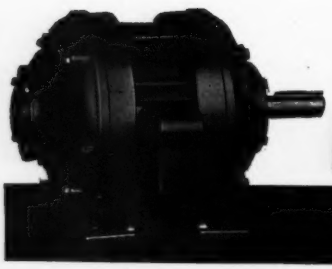

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SEAL-CLAD MOTORS